APR. 14 1961

PETROLEUM WEEK

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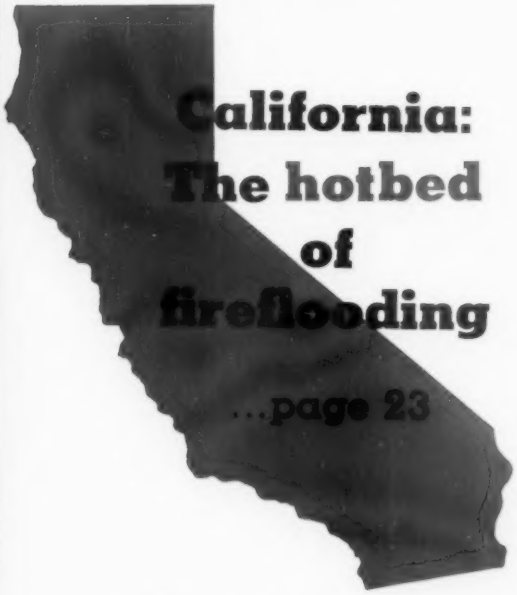

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INSIDE *Slant*

AIR OF INFORMALITY

There is one federal office in Washington that wears on you better than a Florida sun tan.

It is the Dept. of the Interior, headed by Interior Secretary Stewart L. Udall.

There is an air of informality throughout the Interior Building, which unquestionably stems from the office of Udall, who receives visitors—even the press—in the true Western spirit. As all of you know, he is from Arizona.

There is no reference among his staff to the "boss" or to the "secretary," or even "Mr. Secretary."

All persons contacted during a recent visit with the Secretary referred to him only as Stewart.

And chats with him leave you with the same inclination of just calling him Stewart.

Just how he'll handle the oil and gas industry is another question, but indications are that he will not be a difficult man with whom to sit down and discuss your problems.

Then, too, he has an able oil man as Assistant Secretary for Mineral Resources in John M. Kelly of New Mexico.

LeRoy Menzing
Editor

Good Wells Make Good News

Outstanding Results from Recent Dowell Fracturing Treatments

ARRIL 14, 1961

Dowell uses both new and time-proven material and techniques to help operators improve wells. Here are four recent examples:

- **Taylor County, West Texas** (New Oil Well) This development well was to be completed in the Shep Gray Sand Pool at 5321 feet. Operator wanted to get maximum initial production. Dowell notched the formation with Abrasijet* abrasive jetting service, then fractured. A two-jet gun was rotated at 1¼ rpm during jetting to notch casing. Following a 10-gallon spearhead of Freflo* surfactant, Petrojel* fracturing service was used. 11,760 gallons gelled crude, modified with fluid loss control agent, were used to carry 3400 pounds 20-40 mesh sand and 700 pounds 8-12 mesh walnut shells. Well tested 168 bopd in a field where the average test is about 70 bopd.

- **Crook County, Wyoming** (Old Oil Well) This well, completed in 1959, had originally produced 168 bopd, but production had declined to 50 bopd. Pay was the Dakota at about 6000 feet. Dowell fractured using Petrojel. A 200-gallon spearhead of Mud Acid was followed by 20,000 gallons gelled lease crude with fluid loss additive and 20,000 pounds sand. Injection was 22 bpm at 2300 psi. 40 days after treatment, production was 960 bopd with no water.

- **Ouachita County, Arkansas** (Old Oil Well) Production from this well in the Blossom sand, from 2110 to 2117 feet, had declined to 3 bopd. Dowell treated using Riverfrac*. 40,000 gallons salt water with demulsifier added, 20,000 pounds 20-40 mesh sand and 20,000 pounds 10-20 mesh sand were injected down 2⅜-inch tubing at 14 bpm and 1900 psi. After treatment, production was 33 bopd.

- **Hemphill County, Texas Panhandle** (New Gas Well) An interval in the upper Morrow was perforated from 11,930 to 11,950 feet. It gave no show on natural swab test. Well was fractured down 2½-inch tubing twice using Waterfrac. For the first treatment, 20,000 gallons gelled water and 17,750 pounds sand were injected at 10.5 bpm. After load returned, well tested 8500 mcfd with five barrels distillate per million. The second treatment consisted of 2000 gallons regular acid, 50,000 gallons gelled water and 50,000 pounds sand injected at 14.5 bpm. Twenty-four hour shut-in pressure was 5500 psi and well tested 9000 mcfd with 20 barrels distillate per million -- 180 barrels of distillate per day!

Ask your Dowell representative for suggestions about how to get better production from your wells. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma.

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60-Second Summary

THE WEEK'S MOST IMPORTANT DEVELOPMENTS

PETROLEUM WEEK

April 14, 1961

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The Defense Dept. stirred up a hornet's nest of opposition with its plan to barter surplus farm commodities for oil. At least two government departments, along with most oil companies, foresee serious trouble as a result. . . . p. 11

•

California continues as the focal point of fireflood activity. Ten projects have been started in the past five years. . . . p. 23

•

In-line blending is pointing the way for processors to break with tradition and achieve substantial savings in handling operations. It was one of the more popular subjects at this week's Western Petroleum Refiners Assn. meeting. . . . p. 48

•

The oil industry is making progress in its methodical campaign of trimming off the fat that accumulated in the '50s. Personnel figures in annual reports indicate the employment rosters have been cut roughly 10% since 1957. . . . p. 14

•

A new concept of pipeline automation has been proving itself since the first of the year on the Ozark Pipe Line System. It involves an autonomous pressure-activated control of satellite pump stations. . . . p. 40

•

A drill-collar handling device, appropriately dubbed the "Mule," is enabling Imperial Oil Ltd. to cut costs in tripping operations. It is saving 28 minutes per trip. . . . p. 30

•

Cities Service and Richfield have suspended operations on their joint concession in Dhofar, in the Sultanate of Muscat & Oman. But they are not planning, at this time, to give up the concession even though 23 tests to date have been discouraging. . . . p. 37

•

Ohio Oil Co., for years a rural marketer in the Midwest, has taken a second step into urban territory. It has purchased Ross Oil Co. in Akron, and has other plans. . . . p. 42

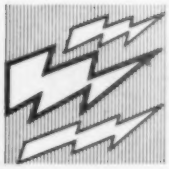
•

Commercial oil exports started by the Japanese in the middle East may trigger a series of changes there. Their Neutral Zone offshore pacts with Saudi Arabia and Kuwait are 56-44 and 57-43 profit-sharing deals. . . . p. 35

•

Gas turbines for automobiles may become a commercial reality in the next four or five years. Automotive engineers are still split sharply in their thinking, but progress is being made behind the scenes. . . . p. 13

Up to the Minute



SIGNIFICANT LATE NEWS

PETROLEUM WEEK

April 14, 1961

The Canadian Government is working quietly on a voluntary import control plan which could become mandatory if it doesn't succeed. The plan reportedly is to be invoked as a step to insure meeting the 800,000 b/d domestic production goal for 1963 that was set earlier this year.

Canadian companies would be required to export 1 bbl. of crude for each 3 bbl. imported. Also, Montreal refiners, who now operate primarily on imported crude, would have to export 1 bbl. of products for each barrel of crude they move into Ontario. And Ontario refiners would be required to export approximately 1.3 bbl. of crude or products for each barrel imported.

•

The three-member Kansas Corporation Commission will assume direct control of its conservation division, at least temporarily. In a political shuffle this week, the Republican-controlled agency ousted Conservation Director Jewel M. Ogden, a Democrat, by abolishing the civil service position, effective Apr. 25. The May crude allowable hearing is Apr. 21. Gov. John Anderson, a Republican, has not indicated whether the conservation position would be reestablished.

•

Exports of U.S. petroleum equipment may jump 50% to 100% under the government's new credit policies, a Commerce Dept. official predicts. John F. Skillman told the Petroleum Equipment Supplier Assn. this week that such an increase "seems reasonably possible." The Export-Import Bank, he said, is working on regulations to implement the policy of extending credit on sales to firms owned wholly or partially by foreign governments (PW—Mar.31'61,p19).

•

Merger of the Western Petroleum Refiners Assn. and The National Petroleum Assn. into a new National Petroleum Refiners Assn. now appears set. WPRA directors approved the merger plan this week in San Antonio. NPA is expected to vote its approval at its semiannual meeting in Cleveland next week. William J. Carthaus, who was reelected WPRA president, said the plan is to complete the merger by July 1, or next fall at the latest. WPRA has 78 member companies; NPA has 58.

•

The Senate will move slowly, but will confirm Kennedy appointees Joseph C. Swidler and Howard Morgan to the Federal Power Commission. Questioning by Commerce Committee members this week wasn't hostile. Morgan's hearing was concluded. Swidler will appear again next week.

The President is expected to endorse legislation to increase FPC membership from five to seven. The proposal by Rep. Oren Harris (D., Ark.) also would give Kennedy power to remove Jerome K. Kuykendall as chairman and name Swidler to the post. Kuykendall could remain on FPC.

Producer and consumer groups met with FPC this week to reach an agreement on the type of costs evidence to be used in setting area prices. The specific issue is Permian Basin prices, but a possible agreement on cost data there may set the tone for other areas.

From Du Pont...TETRAMIX* for greater refining flexibility

In the brief few months since the introduction of Du Pont TETRAMIX* antiknock compound, refiners have found that it offers a new degree of flexibility in their choice and use of lead antiknocks. For example, while its effectiveness varies with gasoline composition (as is true with other antiknocks as well), TETRAMIX is generally effective in low, medium and high dosages.

Results of tests to date indicate that TETRAMIX is also a more effective antiknock in some fuels than either tetraethyl or tetramethyl lead —that is, a given octane number can, in such fuels, be obtained with lower concentrations of TETRAMIX than with TEL or TML.

Based on this refining flexibility and the potential savings it offers in blending, TETRAMIX antiknock compound has already won refiners' acceptance. With commercial quantities available, now is the time for *you* to investigate the potential advantages of TETRAMIX.

Because you have a choice of all three major lead antiknocks at Du Pont, you'll get impartial help in selecting the best one for *your* gasoline stocks. Your Du Pont Petroleum Chemicals Division representative can assist you in evaluating the relative merits of TEL, TML and TETRAMIX.

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Views That Make News

Quota Exchanges: Pro

Dear Sir:

I was deeply disturbed by the suggestion contained in Wanda M. Jablonski's "Petroleum Comments" Column, "Who's Fooling Whom?" (PW—Mar.24'61,p17), to the effect that inland refiners be excluded from participation in the Oil Import Program.

What Miss Jablonski is really proposing, it seems to me, is that the benefits of low-cost foreign crude be confined to a handful of majors who would then proceed to drive inland refiners, predominently independents, out of business. It is difficult to conceive how such a course would be of benefit to the long-term interests of the industry. Independent producers would see much of their markets dry up, and the federal government would be encouraged to move toward tighter regulation of the industry as a consequence of the rapidly diminishing competitive position of companies which are unlucky enough not to have coastal refineries.

Certainly, the present quota system may not be perfect. However, it does control the over-all level of crude imports, and it does endeavor to treat refiners fairly in the allocation of quotas. The ideal solution would be to abandon the quota system and simultaneously increase the import tariff on foreign crude by not less than $1 per bbl. This would be completely fair to all refiners and at the same time achieve the same sort of protection for domestic producers. But because of the international complications involved, it would appear that the tariff approach is out. That being the case, we had better resign ourselves to living under quotas for a long time to come, and we should recognize that any system which protects independent producers but which fails to give cognizance to the position of inland independent refiners will do great harm to the industry.

The cure can't be considered successful unless the patient survives, and this means the whole patient.

HARRY A. LOGAN, JR.
President
United Refining Co.

. . . and Con

Dear Sir:

Wanda M. Jablonski's "Petroleum Comments" column goes straight to the heart of a practice tolerated under the Oil Import Regulations which has done much to discredit the administration of the mandatory program and to promote destructive practice in the industry.

Every refiner is entitled to an equal (not "loaded" on a sliding-scale basis) percentage of the aggregate quota allocation. Any portion of the quota actually imported should be processed in his own plant or plants not otherwise disposed of.

If these enlightened reforms are made, we should be well on the road to the original objectives of the whole Mandatory Oil Import Program, which was to insure the health of the domestic oil industry in the interests of national security.

J. E. DYER
Vice-chairman of the board
Sinclair Oil Corp.

Getting It Straight

Dear Sir:

Your article "Unique Field Gas Unit Built In Canada" [PW—Mar.10 '61,p40] concerned a new process developed by Canadian Equipment Sales & Service Co. (Cessco) for Sage Oil. The Parkersburg Rig & Reel Co., Houston, Tex., licenses Cessco, in Canada, as exclusive sales agent and manufacturer of Parkersburg's line of oil and gas process equipment. Parkersburg built this particular unit.

HOWARD C. KAYLOR
Oilfield sales manager
Parkersburg Rig & Reel Co.

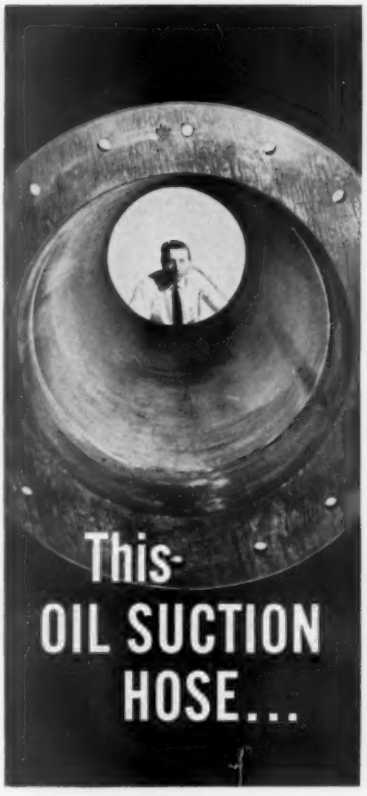
A Reason For Research

"Today the domestic oil industry spends at least eight times as much to find a barrel of oil as it did in 1936. We should therefore have a good reason to invest a budget of considerable size in fundamental research, not only to sharpen present techniques, but to devise new approaches to the oil-finding problem."

—CHARLES M. MOORE
Vice-president
Geophysical Service Inc.

PETROLEUM WEEK *will publish each week comments from readers on timely, pertinent subjects. Such expressions are welcome.*

Address all such correspondence to LeRoy Menzing, Editor, PETROLEUM WEEK, *330 W. 42nd St., New York 36, N.Y.*



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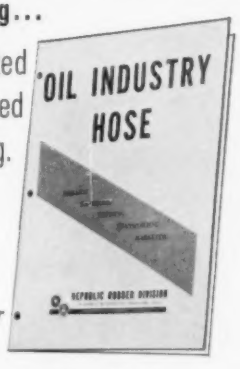

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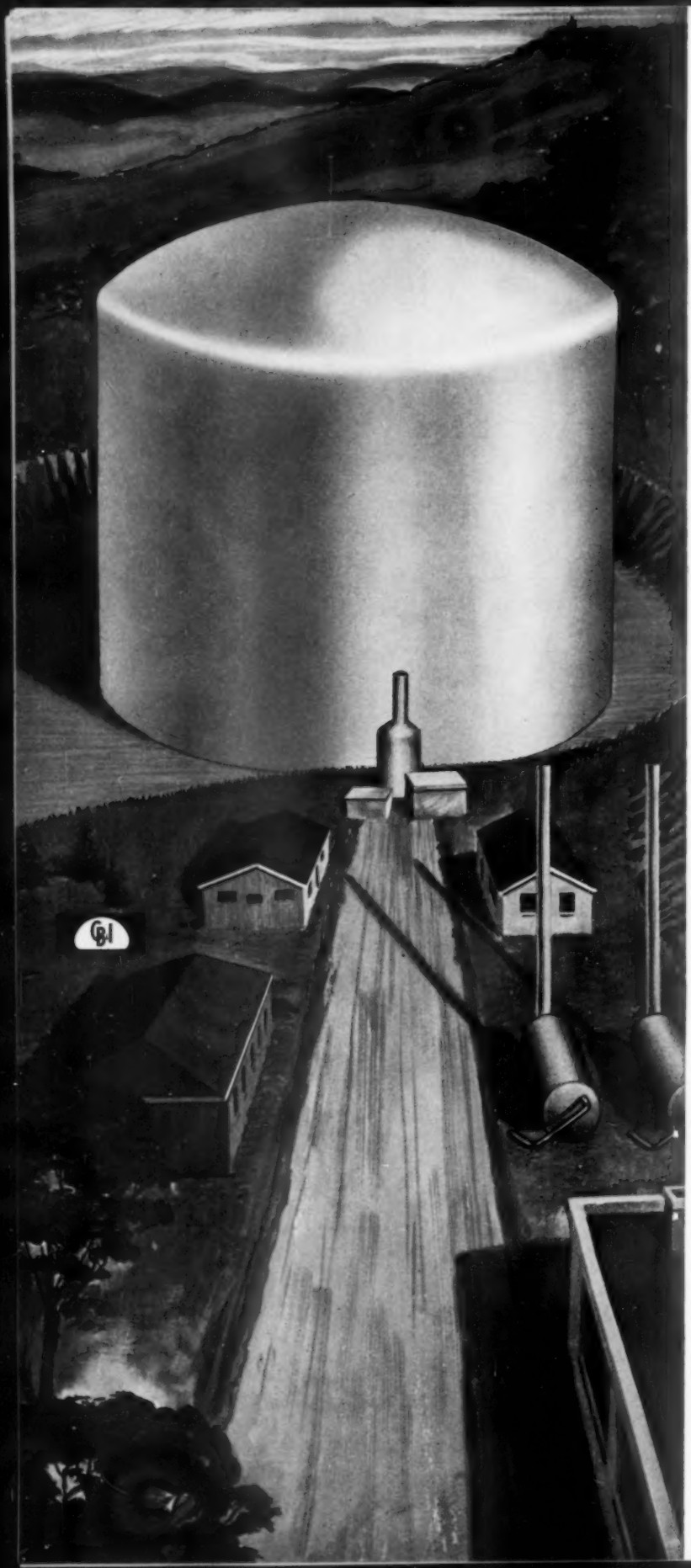

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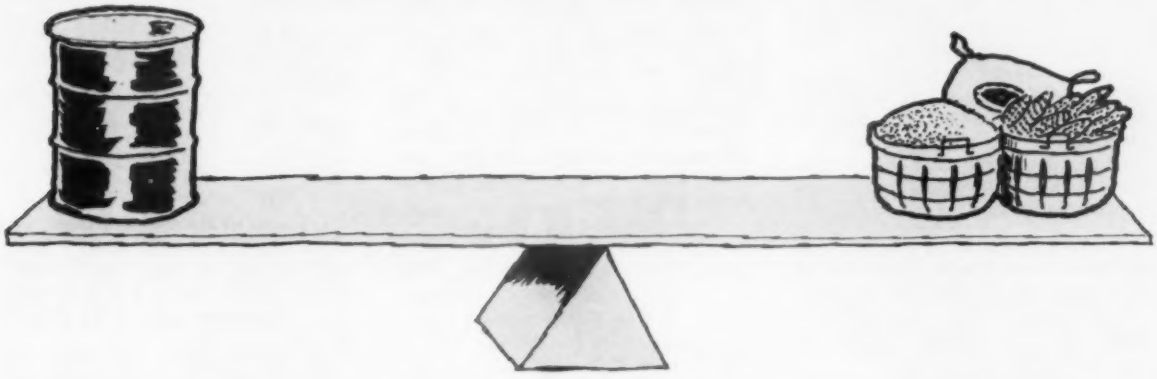
Swapping surplus farm products for oil . . .



Most Companies Hit Barter Plan

The Defense Dept.'s plan to barter agricultural commodities for petroleum products acquired abroad has stirred controversy and confusion in both government and industry.

After much discussion, Defense last week finally unveiled a test run of its scheme to pay for oil products with surplus farm crops. The tryout will be on 6.2-million bbl. of Navy Special fuel oil needed on the East Coast during the six months starting July 1. Bids will be opened May 3.

Normally, a handful of major companies supply the Navy's fuel oil needs on the East Coast from the Caribbean area.

Oil companies that offer foreign oil for the forthcoming test will have no choice but to accept trades in farm surplus. Suppliers offering domestic fuel oil, on the other hand, would be paid in dollars if they should submit winning bids.

The companies bidding under the grain-oil barter proposal will have to go through a series of complex steps.

First, they will have to make arrangements to get farm surplus from the Commodity Credit Corp., an agency of the Agriculture Dept. Then they will have to retain international commodity trading companies to take the surplus, and sell it overseas.

Bidding on the oil will be in dollars. The Military Petroleum Supply Agency of the Defense Dept. will pay CCC the dollar value of the oil, plus the brokerage fees for traders. CCC will deliver the equivalent in crops to the traders, who will sell them abroad and pay the oil companies.

The 6.2-million-bbl. fuel oil requirement will be imported under MPSA's quota.

The services aren't expected to be willing to pay too high a price to make bartering work.

Since MPSA will have to pick up the cost of brokerage fees for the traders, there is a built-in higher price to begin with.

To compensate for the complication of dealing with CCC and commodity trading companies, and for the uncertainty in this new type of deal, the oil companies may find it necessary to bid higher than they would ordinarily.

With such complexities in the bidding, one international oil company official predicts that a supplier of domestic fuel oil might be able to offer the lower bid for some of the requirement.

Oil company opposition to the barter plan has been strong. In fact, there has been some discussion of boycotting the test bid.

The primary objection is that the proposal puts it up to oil suppliers to find markets for farm surpluses overseas in order to get government business.

Finding markets for surplus farm products won't be easy, since the U.S. is not the only country with such surpluses to sell or trade. Also, CCC has a rule that bars the trading of these crops in the hard-currency countries of Western Europe where there are markets already established.

That will put a definite ceiling on just how much farm surplus can be expected to be bartered, even with a wide choice of products for trading—wheat, corn, oats, rye, barley, cotton, tobacco, and dried milk.

CCC officials say that should the bartering plan interfere with present sales of grain, small losses might be tolerated if that would make the plan work.

Oil companies are also concerned over just how they are to be paid in the long run, and just how many commissions may have to be absorbed by the government or the oil suppliers.

CCC officials say they do not know whether the firms trading off the grain will be paid in dollars, some other hard currency, or a soft currency. "That's a matter for negotiation between the oil companies and the grain traders," one aide says.

MPSA officials, on the other hand, explain that their talks with commodity trading firms indicate that oil companies will be able to get dollars "if they insist, but they might make better deals if they take some other currency."

Some oil men are skeptical over the commissions to be included in their price offers on oil. Since grain brokers' commissions vary from a fraction of a percent to several percent, the success of an oil company bid for a barter deal could hinge on finding a broker with the lowest fee.

They note, too, that bankers are approaching them to help arrange financing—also for a fee.

One oil company official blasts the

plan as unsound for the government and for oil companies—"in fact, for every one involved in the proposal except commodity traders."

"The whole concept of barter deals," he explains, "is contrary to our government's trading policies. The U.S. has been critical of trade-barter agreements between other countries, "particularly when swaps of commodities were involved."

This official also asks: "If trading farm surpluses is such an attractive proposition, then why does the government need help from oil companies? It appears to me to be a heyday for commodity brokers."

Another oil executive predicts that the barter transactions could lead to complexities in pricing between farm commodities and oil that would eventually mean "dumped" prices on world markets.

That situation would be opposed to the policies the U.S. has maintained in its overseas trading, he notes, and "certainly friendly nations will be critical of a switch."

Then he adds: "I can see the impact on world prices of playing with the multiple price positions between commodities and oil, and I don't think our company would touch such a deal without legal clearance. I remember the suits on overseas pricing of oil that were instituted by the U.S."

Objections aren't confined to the oil companies, however; both the Treasury and State Depts. have reservations.

For example, success from CCC's standpoint—moving more farm surpluses abroad—might cause trouble for the State Dept.

Canada, for one, fearing that more U.S. wheat will be dumped on the world market, is wary about the plan.

Other commodity-exporting nations also would complain quickly if there was a big increase in U.S. exports in face of the existing world surpluses.

The Treasury Dept., most directly concerned with the balance-of-payments problem, isn't enthusiastic over the idea, but thus far is remaining neutral.

Says one high Treasury official, "We take the view that this will not have any substantial impact on the balance of payments because the commodities that go overseas will simply replace present dollar purchases."

There are numerous oil company officials who endorse that view.

The only strong support for the barter plan comes from Defense Dept. officials, who conceived the idea as a "contribution to the balance-of-payments deficit abroad."

Their reasoning for the proposal—which dates back to early 1961 (PW—Jan.27'61,p14) is that they could not cut back petroleum purchases abroad to stay within President Kennedy's directive to reduce overseas buying to control dollar costs abroad.

Oil is the largest single Defense Dept. purchase abroad. Defense top brass feel that foreign sources of supply must be maintained for strategic reasons. And the cost of a shift to entirely domestic sources of supply "was found to be too high," one official comments.

Bartering, therefore, seemed to Defense officials a possible way of making a contribution to the gold-outflow problem, and the decision was made to try it.

A smaller trial was made on some undersea cable equipment for Cape Canaveral. This isn't complete yet, but taught CCC officials enough to feel that oil purchasing through bartering was worth a trial.

Oil companies contacted in January were solidly against the plan and, as one put it, "We were told by officials in Washington that it would not be pressed."

But this week a Defense spokesman noted that, "while we got a lot of complaints, we decided to give it a try and see how it looks when the bids come in."

Officials at the Defense Dept. and those with Commodity Credit Corp., who will run the test, won't predict success at this point, but they argue that the possible gains make it worth trying.

An MPSA official says that commodity traders "have been hounding us since the plan was announced. The oil companies won't have any trouble making satisfactory deals."

Whether the plan is extended to other oil purchases abroad, or to other Defense Dept. needs, will depend on two chief factors: the cost of the plan to Defense, and whether an increase in surplus commodity exports actually results.

On both scores, there are more negative than positive predictions.

Permian, Dakamont Plan Merger

Two of the largest crude trucking companies in the country—Permian Corp., of Midland, Tex., and Dakamont Exploration Corp., of Denver—are planning to merge shortly.

Plans of both companies are subject to stockholder approval.

The proposed terms involve the exchange of one share of Permian stock for 31.66 shares of Dakamont.

The merger will make Permian, with Dakamont as a division, the largest independent purchaser of crude in the U.S.

Combined purchases of Permian and Dakamont exceed 200,000 b/d.

Operations of the merged company will remain essentially the same, and no personnel changes are anticipated, spokesmen say.

Permian now purchases in Mississippi, Louisiana, Alabama, Texas, New Mexico, Oklahoma, and Kansas. Dakamont and its subsidiary, Western Crude Marketers, Inc., purchase in Nebraska, Colorado, Montana, Wyoming, and the Dakotas.

Both firms transport via tank truck and pipeline to major receiving points.

Permian's earnings for the six-month period ending last Nov. 30 were $583,000 on sales of $32,793,000. Dakamont reported earnings of $347,000 on $25,098,000 sales for the six-month period ending Jan. 31.

Principal stockholders of Permian are Walter R. Davis, Midland, and George Nolley, Tulsa. Dakamont principals are Cortlandt S. Dietler and Jack Olson, both of Denver.

NEXT WEEK ***Be Sure to Read:***

SPECIAL REPORT: Pipeline automation . . .

Increasing reliance is being placed on automation as a tool to cut costs and improve efficiency. Between 60% and 80% of pipeline companies' expenditures for improvements this year will be for automatic controls. But closed-loop computer control for pipelines is at least three years away.

Are Gas Turbines in Sight for Cars?

Car makers are split sharply in their thinking about gas turbines—but there's an outside chance that passenger cars may be using them four or five years from now.

Things are a bit different now than in the past, when each new gas turbine for motor vehicles was introduced with a fanfare of publicity.

But progress is being made behind the scenes—and evidence is mounting that the automotive turbine may become a commercial reality sooner than had been anticipated.

Of the "Big Three," Chrysler Corp. alone is aiming its turbine for passenger car use.

Ford Motor Co. and General Motors Corp. still feel that the future of the gas turbine lies in heavy-duty trucking and off-the-road vehicles.

Their development efforts are pointed in this direction. Both have experimental turbine-powered trucks running now.

Their theory is that truckers can amortize the initial cost penalty through the gains resulting from lighter weight and added power.

But there are only 15,000 or so heavy trucks produced each year—and this is not mass production by auto industry standards.

Chrysler's research experts do not go along with this thinking, however.

As a result, their progress on gas turbines, under the direction of George J. Huebner, executive engineer, is conceded to be further along than any other automobile manufacturer.

A gas turbine engine for automobiles could present a daring gamble for Chrysler—and could pose a variety of problems for oil, too.

Chrysler's thinking is that the unit would have to be featured in a volume car—which, in this case, would be its Plymouth.

Huebner's calculations indicate the turbine could be tooled for one-sixth to one-half the cost of an equivalent all-new reciprocating engine.

But what if it were not accepted by the public? That's where the gamble comes in, for a turbine-powered car would have to be completely reengineered and restyled around its power plant to gain maximum efficiency. No radiator is necessary, for example, and the lighter front-end weight would require redesign of the steering mechanism and springs.

Oil's problems could involve such things as diesel fuel in mass outlets, special training for service station personnel, and a further loss in the lube oil market.

Detroit sources point out, for example, that if a mass-produced car turbine is to be practical in a mass-produced car, oil companies must make diesel fuel or clear gasoline universally available. Present outlets on truck routes and turnpikes obviously would not be sufficient.

Leaded gasolines are not considered suitable, whether or not the turbine is regenerative. This is because deposits affect the efficiency and soon render the turbine inoperative.

Among other factors that oil people would have to consider:

- A turbine powered car is no market whatsoever for antifreeze, radiator hoses, and fan belts. And since such a car needs only one sparkplug—and this is used only in starting—there would be no market for either plugs or their servicing.
- Present turbine designs require oil capacities ranging from one to four quarts. Premium motor oils. Type "A" transmission fluid, and synthetics are used. No change interval is specified, but since the lube is not exposed to combustion, the change interval would be lengthened greatly. All this adds up to less opportunity for under-the-hood selling.
- There will be a training problem with service station personnel.
- Engineers assume that turbine fuel consumption, at introduction time, probably will be no better than that of existing reciprocating engines of equal power. So there won't be much change here for a while. The goal of the turbine experts now is to equal the present consumption economics of conventional engines.

Surprisingly, the first full effects of the turbine engines will probably be felt in the boating industry.

Kickhaefer Corp. and Boeing Airplane Co. have teamed up to produce a stern-drive gas turbine for boats. The current price tag is about $10,000, but they're shooting for $3,000.

Ultimately the use of turbines will add more fire to the present squabble over leaded and unleaded gasolines in marinas—which could create more marketing headaches for oil companies.

Oil's chief interest, however, focuses on automotive power plants, and Chrysler's newest engine is intriguing—both technically and conversationally.

The new unit is a 140-shaft-horsepower turbine that's being made available to research organizations for around $35,000 each. Several oil companies have expressed interest, but with a production rate of one per month, Chrysler is leaning towards customers with an application in mind.

The latest model weighs half as much as a reciprocating engine of 140 hp. Its developers claim equal acceleration speeds and engine braking

Significant Sidelights

■ **The way sales of oil country tubular goods have been going in recent months has manufacturers convinced that company inventories of many items are exhausted.**

"You can't help getting the feeling, in looking over the order sheets, that they're out of stock and are buying on a requirement basis," one big supplier commented. To support his contention, he cited a variety of orders for casing—odd lots of 23 tons, 41 tons, 47 tons, and so on. "If they were buying for inventories, they would be 50-ton or 100-ton orders," he said. He also noted that most buyers specify quick delivery—which means that the casing, or whatever it is, is needed for immediate jobs.

Suppliers were disappointed in the first quarter, but are hopeful the second will be better. They note that rock bit sales are up a bit—and this is an indicator they watch.

—an unusual feature for turbines. The latter is achieved through a variable nozzle system somewhat akin to the reversed thrust used to brake jet aircraft.

Huebner says the variable nozzle system has licked three problems: the expensive low-speed, part-load fuel consumption characteristics of gas turbines; the lack of engine braking characteristics; and the time lag between pressure on the accelerator and full-power response of the engine.

The new engine can be enclosed within a space as small as 27 x 27 x 25 in.

Basic Import Issue Up for Study

Next month's hearings on imports of crude and unfinished oils will delve into the basic issue of controls rather than just into changes in procedures, John M. Kelly, Assistant Secretary of the Interior for Mineral Resources, said this week.

The first hearing, for West Coast imports, will be in Los Angeles May 4. The second, on import controls for the areas east of the Rockies, will open in Washington May 10.

Department officials believe they succeeded in making sound improvements in the residual fuel oil imports program as a result of the public hearing in March.

Kelly told audiences that, in recent years, decisions on fuels have been "hammered out behind locked doors," but that under the new Administration, greater public participation will be sought.

The review of import controls will include "the philosophy which underlies it, the machinery by which it operates, and the effectiveness of this machinery in meeting the objectives of the program," Kelly said.

"We want to hear all views on the question of the need for import controls. From those who feel such a program is necessary, we want to know how it should be operated, how import levels should be set, to whom allocations should be given, and on what basis they should be set," Kelly said.

"We want to know where the inequities lie, and we want specific suggestions to alleviate them."

Kelly said he was "gratified" that many oil leaders have decided to support a national fuels study.

"Unthinking, blind opposition within the petroleum industry to an impartial, long-range study can easily leave the mistaken impression that the interests of the industry are somehow different from the interests of the nation," he said, adding that the oil industry must drop the "outworn creed" that looks at "cooperation with government as a mutually antagonistic partnership."

Oil has sought government involvement on many counts, Kelly said, "as being in its own best interests. Conversely, it must willingly accept government as a referee of the industry, as its shield in foreign affairs, and as the protector of the public interest."

O. D. Donnell Dead, Headed Ohio Oil

Otto D. Donnell, 77, who directed the expansion of Ohio Oil Co. from 1927 to 1948, died this week.

He took over the presidency of the company from his father after a 17-year period of a rapid rise of the company as a crude producer. The younger Donnell's first mission was to intergrate the still-growing company and to consolidate its gains.

Donnell started with Ohio Oil, then a producing affiliate of the old Standard Oil Trust, in 1895, as an office boy during his summer vacation. After receiving an engineering degree from Case Institute of Technology he became a full-time employee in the pipeline department.

He is survived by his widow and three sons, J. C. Donnell II, now president of Ohio Oil, John R. Donnell, and Dewey Donnell.

Oil Employee

Oil's employee rosters have been pruned substantially in recent years by cost-conscious managements, in the continuing struggle to offset spiraling costs and tightening profit margins.

The extent of the cuts can be gleaned from the annual reports of the leading oil companies; in virtually all cases they reflect the tighter controls that managements have been exercising over payrolls and other costs.

The cuts, for the most part, have been piecemeal and sporadic, with the bulk of them coming over the past four or five years.

A few companies bucked the general trend, and wound up the year 1960 with all-time highs in their numbers of employees. But these were exceptions, rather than the rule.

It has been a seesaw period for most of the companies, but the majority are down substantially from their peak years of employment.

In round figures, it would appear that the industry's work force has been trimmed nearly 10% since 1957—the peak year of employment.

This estimate is based primarily on the annual reports of 23 leading companies whose gross incomes in 1960 put them on top of the pile. The table (right) shows the changes that have taken place—and it lists the companies in the order of their gross earnings in 1960 (PW—Apr.7'61,p16).

The aggregate of their employees in 1960 was down 63,000 from 1957. In other words, from 669,000 in 1957 to 606,000 last Dec. 31.

If these totals were extrapolated to characterize the industry as a whole, it is highly probable that total reductions would aggregate 100,000 or more workers.

If the number of employees liquidated by these companies since their peak years were to be totaled as a group and compared with 1960's statistics, the figure is well over 100,000 already.

The pruning process has varied from company to company, but some cuts have been fairly extensive—ranging as high as 38% in one case.

This exceptional incident is that of Tidewater Oil Co. Unlike the majority of companies whose peak years came in 1956 or 1957, Tidewater's high point was back in 1952.

Rosters Are Down Nearly 10% Since '57

At that time, it had nearly 12,000 employees. These ranks were thinned in 1953 and 1954 so that by 1955 the company's roster was down to 9,100 people. It has been in the 9,000 bracket since then, so that recent cuts haven't been too severe.

Many companies have made no bones, publicly or privately, of their intentions to pare payrolls to keep costs in line with productivity and earnings.

Atlantic Refining Co., for example, stressed just that point in its annual report. Atlantic's employee roster was trimmed 9% in 1960, and is down 34% since its peak year of 1954.

John E. Swearingen, president of Standard Oil Co. (Ind.) told a group in Chicago that his company intends to offset part of the recent 5% general wage increase "by further reductions of the work force." Indiana's personnel roster already is 20% less than it was four years ago.

Socony Mobil Oil Co.'s president, Albert L. Nickerson, pointed to his firm's cost-control program as one of the most significant developments last year. He acknowledged that the program was "greatly intensified in 1960."

Socony's worldwide figures tell only half of the story, however. In this country, its work force has been trimmed 14% since 1957, with 5,000 people departing in 1960 alone.

Most companies are reluctant to say too much publicly about their austerity programs, but virtually all have acknowledged that the fat that accumulated in the '50s is being taken off methodically.

Company payrolls are reflecting the resulting economies.

Standard Oil Co. (N.J.), for example, has shaved $55-million from its wage and benefit costs by slimming down from 160,000 to 140,000 workers. Numerically, this has been the biggest slash by any major company. Jersey, like many others, has been engaged in a massive reorganization.

Indiana's Swearingen has said that his firm's payrolls would be $80-million higher now if the company hadn't pulled back sharply. The annual report shows that the firm's payrolls have been trimmed $26-million from the peak years of 1957 to $344-million.

Atlantic's wage and benefit costs were down $7.4-million from the peak; Gulf's were off $2.5-million; and Standard Oil Co. (Ohio) trimmed $3.3-million, to cite a few more.

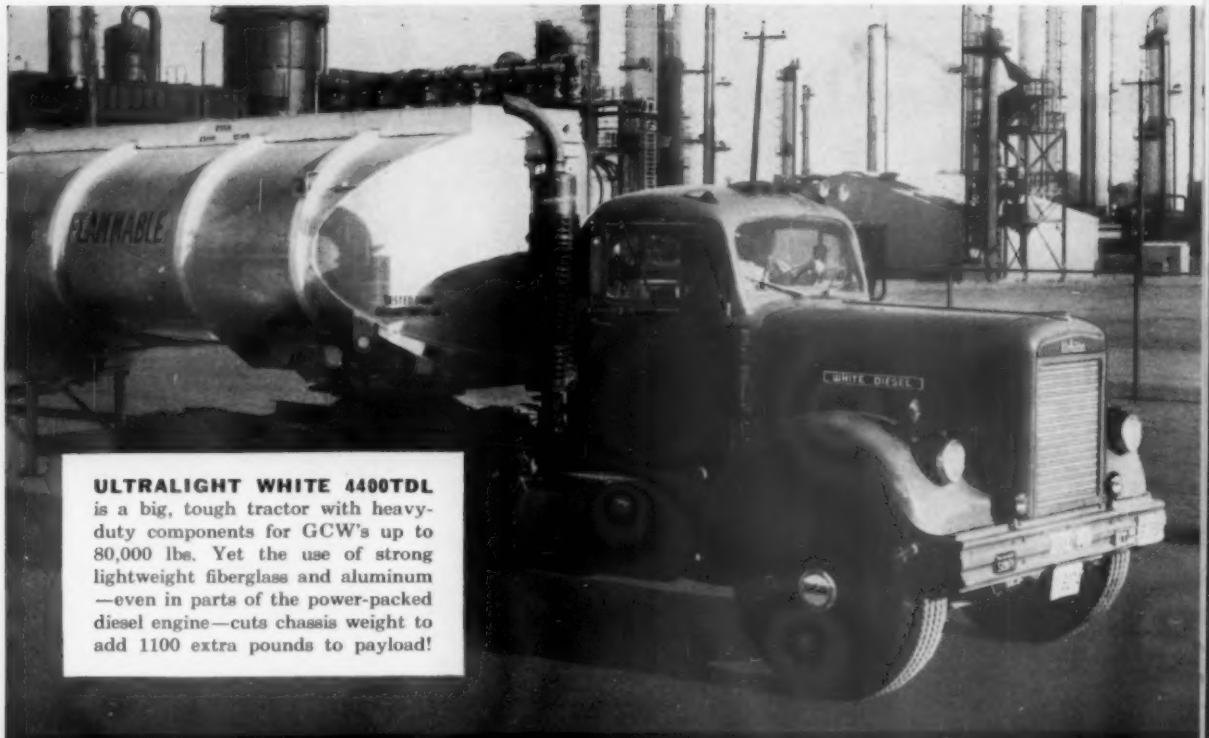
The industry reductions were put into effect in a variety of ways—accelerated retirements, nonreplacement of retirees or resignees, consolidations, and terminations.

In cases where shutdowns, consolidations, or even automation put workers in surplus categories, managements took the sting out of the displacements by providing liberal severance allowances and privileges.

And most bent over backwards in helping displaced employees to relocate in other industries or areas.

Most of the Top Companies Have Tightened Their Belts Considerably in Recent Years

	Number of Employees 1960	Number of Employees 1959	% Change '60/'59	Peak Employment (Year)	% Change '60/Peak Year
Standard (N.J.)	140,000	146,000	— 4.1%	160,000 (1957)	—12.5%
Socony Mobil	65,600	72,100	— 9.0	76,200 (1956)	—13.9
Gulf	47,400	50,700	— 6.5	61,100 (1957)	—22.4
Texaco	56,568	53,510	+ 5.7	56,568 (1960)	.....
Standard (Calif.)	37,986	38,390	— 1.0	40,121 (1957)	— 5.3
Standard (Ind.)	41,706	43,659	— 4.5	52,012 (1956)	—19.8
Shell	38,290	38,217	+ 0.2	40,465 (1957)	— 5.4
Phillips	25,209	24,575	+ 2.6	27,461 (1956)	— 8.2
Sinclair	21,770	23,557	— 7.6	25,191 (1957)	—13.6
Cities Service	17,800	17,900	— 0.6	19,300 (1957)	— 7.8
Continental	11,669	11,333	+ 3.0	11,669 (1960)	.....
Sun	17,219	17,292	— 0.4	18,319 (1957)	— 6.0
Pure	10,018	10,740	— 6.7	12,869 (1955)	—22.1
Tidewater	9,036	9,361	— 3.5	11,864 (1952)	—38.4
Atlantic	13,967	15,394	—11.0	21,191 (1954)	—34.1
Union	7,877	7,932	— 0.7	8,823 (1956)	—10.7
Sunray	5,768	5,894	— 2.1	5,955 (1956)	— 3.1
Standard (Ohio)	10,308	10,690	— 3.6	11,587 (1957)	—11.0
Richfield	6,303	6,374	— 1.1	6,374 (1959)	— 1.1
Ohio	7,631	7,534	+ 1.3	7,631 (1960)	.....
Signal	4,022	3,176	+26.6	4,022 (1960)	.....
Ashland	4,600	4,600	.....	4,800 (1957)	— 4.2
Skelly	4,727	4,787	— 1.3	4,875 (1955)	— 3.0



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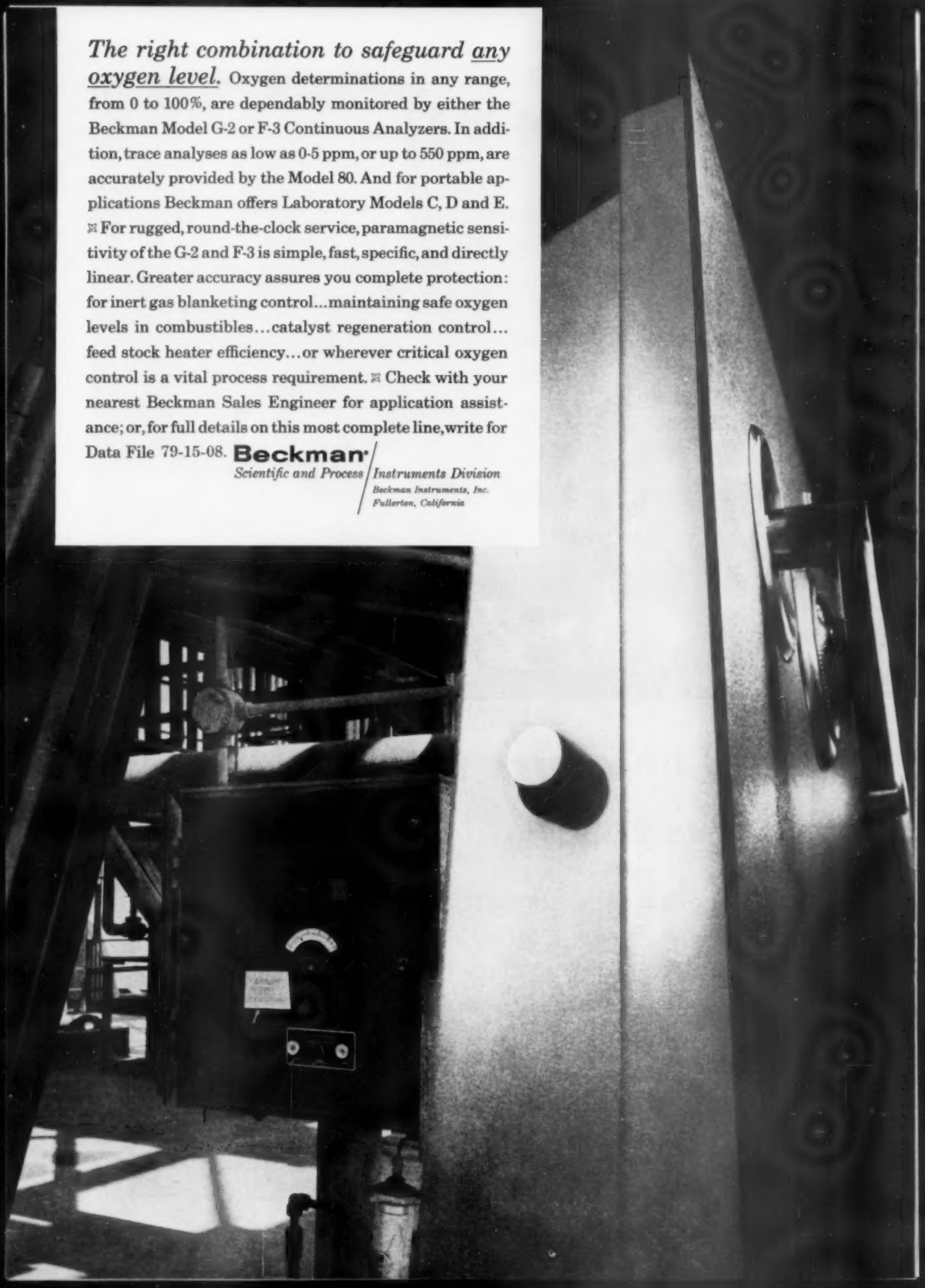

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What's New IN THE INDUSTRY

Sun Oil Co. this week asked the Texas Railroad Commission for a rehearing on rules for the southeast Quitman field, Woods County, in light of the Texas Supreme Court decision in the Normanna field case. (PW—Mar.10'61,p10).

Shell Oil Co. and Amerada Petroleum Corp. joined in the motion for the rehearing. The commission had adopted a 50% acreage, 50% well allocation formula for the field. Sun maintains that this does not fit the requirements set down by the court in the Normanna case, in that it prevents some operators in the field from getting their fair share of the allowable.

•

Sohio Petroleum Co. is moving its Tulsa and Houston crude supply offices to Oklahoma City, effective May 1. The company says the new location will enable the supply division to maintain close liaison with the exploration and production departments in Oklahoma City.

•

Texas' State Land Commissioner is campaigning for state reservation of mineral interests on 200,000 acres of the proposed Padre Island National Seashore Area.

A bill to set aside a portion of the island as a federal recreation area is pending in Congress. And Commissioner Jerry Sadler is worried about the wording. He is urging federal officials to change the bill from saying the Interior Secretary "may permit" a reservation of minerals by grantor in transferring land for seashore development to "shall permit." He says that the state appears to have "many millions of dollars of oil and gas reserves under the 200,000 acres owned by the state in the proposed park area."

•

Ohio Oil Co. has received formal approval from the Spanish government in northern Spain as an outlet for its Libyan crude (PW—Feb.10'61,p38). The company said this week that it would bear 84% of the cost of the $18-million plant, and would retain a 28% ownership.

Ohio will provide 100% of the crude requirements of the plant for the first ten years, or 10-million tons of crude, whichever occurs first. During the second ten-year period, Ohio will supply part of the crude requirements on a preferential basis.

•

Major suppliers are following the price increases for steel tubular goods kicked off late last month by the National Tube Division of U. S. Steel Corp. The boosts range from $1 to $6 a ton. Only three diameters—4½-in., 5-in., and 5½-in., all O.D.—are affected. The new prices range from $108.82 per 100 ft. of 9.5-lb., 4½-in. O.D. pipe, up $6 a ton, to $169.18 per 100 ft. of 15.5-lb., 5½-in. O.D. pipe, up $1 a ton.

•

Humble Oil & Refining Co. is transferring Permian Basin operating personnel of its Monterey division into its Midland Area organization. Humble acquired Monterey Oil Co.'s producing properties last January.

The 26 Midland employees of Monterey will be given similar jobs in Humble's production and exploration activities, which are headed by J. C. Posgate, area manager, with R. R. McCarthy as area production manager, and R. W. Bybee, as area exploration manager.

J. J. O'Brien, formerly vice-president in charge of the Mid-Continent area of the Monterey division, will become acting operations superintendent under McCarthy. In exploration, Charles J. Cerf, former district landman for Monterey, will join the staff of L. W. Sewell, Midland area landman.

•

Amerada Petroleum Corp. has purchased a 50% interest in Signal Oil & Gas Co.'s Tioga (N. D.) natural gas plant for an undisclosed amount. The plant now processes approximately 48-million cf/d, with a daily production capacity of 4,500 bbl. of natural gas liquids and 50 tons of sulfur.

•

Indiana Standard this week sewed up its second foreign refining and marketing venture —this time in Italy. Its $14.5-million bid was accepted for the 25,000 b/d Cremona refinery of Raffineria Italiana Olii Minerali and a chain of 700 service stations in northern and central Italy. Amoco Italia will operate the properties.

Looking Ahead in Washington

PETROLEUM WEEK

April 14, 1961

The Justice Dept. clearly intends a "get tough" policy toward business in the antitrust field. Attorney General Robert F. Kennedy and his antitrust chief, Lee Loevinger, have laid this out in detail. Kennedy says price-fixing investigations are in progress in "almost every section of the U.S.," but he doesn't specify the industries. He urges national business groups to adopt codes of ethics to avoid repeats of the price-fixing suits in the electric equipment business.

•

Higher tariffs as a substitute for mandatory oil import controls may be broached in forthcoming Interior Dept. hearings on imports. Sen. Ralph Yarborough (D., Tex.) has asked a 100,000 b/d cut in crude imports, and says that if something isn't done to reduce imports "adequately," he will push for higher tariffs. This would put a "fairer share" of taxes on the major companies, and induce them to increase their domestic production, he says.

The opposite view on oil imports comes from the Council for Economic Development. This group of industrialists and educators interested in promoting free trade policies has completed a two-year study in which it urges the removal of oil import restrictions as one of nine major recommendations for improving U.S. relations with Latin American countries.

•

Coal industry spokesmen hail Interior Secretary Stewart L. Udall's recent call for "a sound fuels policy" as a major Administration statement of position. They complain that the statement, at a National Coal Policy Conference dinner, didn't get the attention it deserved, and point out that both the wording and the fact that Udall was working on the address until shortly before the dinner indicate that it was fully cleared with President Kennedy. Udall's insistence that "we must consciously plan our energy production and use requirements so that we will have a stable and sensible fuels picture in the troubled years ahead" will prove one of the most significant guidelines for the new Administration, they say.

•

In-place sales of natural gas have moved quickly under the Federal Power Commission microscope. Tennessee Gas Transmission Co. made the biggest deal of this type when it agreed to pay Pan American Petroleum Corp. $159-million for its Bastian Bay reserves in the Gulf off Louisiana (PW—Apr.7'61,p13). The purchase was in lieu of buying production from the reserves under a long-term contract.

TGT connected the 1-trillion cu. ft. of gas reserves to its interstate system under a "budget type" permit—an authorization that allows a pipeline to undertake small projects without going through FPC hearings. Tennessee said nothing beyond the "budget type" authorization was required to connect the Bastian Bay reserves. FPC disagreed; saying there was "reasonable doubt" whether Tennessee's move was legal. The commission will hold hearings beginning May 22 to look into the transaction.

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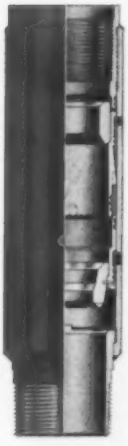
TECHNICAL SUMMARY

"DV" Multiple Stage Cementer — The depth desired for the upper cement stage determines the point at which the "DV" Multiple Stage Cementer is made up in the casing string. The lower stage of cement is pumped through the end of the string in the usual manner. At this point, an Opening Bomb is dropped to the opening sleeve seat in the "DV" tool. Applied pump pressure against this bomb moves the sleeve down, opening the cementing ports to the well bore through which the upper stage of cement is then pumped. Following cement placement, a Closing Plug is dropped down the casing to seat in the closing sleeve of the tool. Here the novel hydraulic differential principle of the "DV" tool becomes effective. Applied pump pressure moves the closing sleeve down, telescoping it into the opening sleeve, sealing off the ports. The sleeves are permanently locked together and to the lower member of the tool body, preventing them from rotating during drilling out operations. By using displacement type plugs, the upper and lower stages of cement may be pumped together, making the job a continuous operation.



AUXILIARY TOOLS

One or more Halliburton Cement Baskets may be run below a "DV" tool to retain cement and help protect weak or porous formations from breaking down. For more uniform cement placement, Halliburton S-3 Casing Centralizers should be used.

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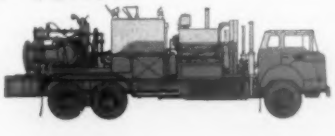

CEMENTING SERVICES

Halliburton
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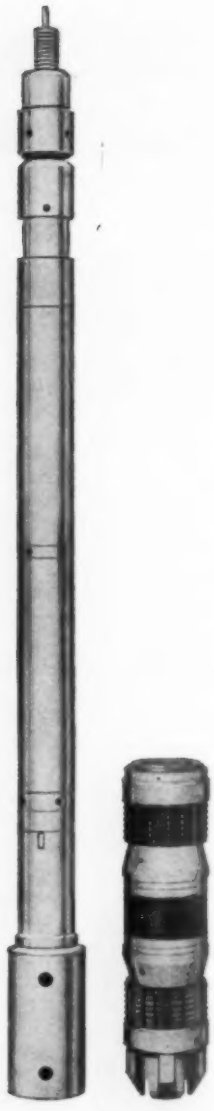

Baker Wire Line Pressure Setting Assembly, Product 437

Baker Wire Line Bridge Plug, Product 400-N

RUNNING MATES

A Baker Bridge Plug is tough and reliable. So is a Baker Wire Line Pressure Setting Assembly. They're running mates—a matched pair. They've been working together for years, building a reputation for dependability.

The average wells or the hot, high pressure wells—a Baker Bridge Plug masters them all. Whether you measure its life span in hours or in years, it's got what it takes to do its job.

Setting a plug on wire line today is a simple operation, and a fast and sure one. What makes that possible is the Baker wire line setting tool. A good setting tool is as important as a good plug.

Like the bridge plug itself, the setting tool is a Baker innovation. A Baker plug and Baker setting tool work well together because they were designed to do just that.

Leading wire line service companies set Baker Wire Line Bridge Plugs accurately and promptly using the Baker Wire Line Pressure Setting Assembly.

Other models of Baker Bridge Plugs can be set on tubing or drill pipe. They are all made in drillable, corrosion-resistant cast iron for permanent service, and in fast-drilling magnesium for temporary service.

BAKER WIRE LINE BRIDGE PLUGS

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California: Focal Point of Firefloods

California has become the center of fireflood activity in the past five years, with ten projects started and four still active.

Two active projects are under way in Kern County and the others are in Orange and Monterey Counties.

Combustion has been abandoned in projects in Kern, Ventura and Orange Counties. And as a preliminary to a possible fireflood, La Brea Corp. of Texas, an affiliate of G. E. Kadane & Sons, recently drilled a series of eight shallow coreholes in Kern County.

The stakes are high, for a large share of California's heavy oil cannot be recovered by primary methods or by conventional water or gas injection.

Oil men predict they can recover only 26.5% of the original oil in place in the state, or 16.5-billion bbl., by primary and conventional secondary recovery methods, according to a report submitted to the Interstate Oil Compact Commission at its midyear meeting last year in Detroit.

This means that 45.5-billion bbl. of oil already found will be unrecovered unless new forms of secondary recovery are used.

Firefloooding might add 4.1-billion bbl. to the reserves and bring them to 33.2% (or 20.6-million bbl.) of the 62-million bbl. calculated to be the original contents of the reservoirs discovered to date in the state. That was the import of the report to the IOCC by Paul Torrey, chairman of the Secondary Recovery and Pressure Maintenance Committee.

A tight curtain of secrecy has shrouded all firefloods undertaken in California, except one.

The majority of operators seem to feel they can gain a competitive advantage by withholding facts and figures. Another question concerns the patentability of equipment and techniques, but some patent attorneys say only a few of the many patents already granted would hold up if contested.

Those opposed to the prevalent "no-dope" attitude say they believe an exchange of information would make possible faster progress in development of fireflood techniques. They say the amount of work to be done can be staggering for one company, and an exchange of experience would be beneficial for all.

No information—not even an acknowledgement that a burn was in progress—has been released on five of the ten projects in the state.

Information on success or failure of those projects completed or sufficiently advanced for results to be available is totally restricted.

An exception to the information blackout is the South Belridge thermal recovery experiment conducted by Mobil Oil Co. (then General Petroleum Corp.) as operator for 12 companies. The operator released most details shortly after completion, including figures indicating production of some 50% of the oil initially in place during the year and a half after ignition (PW—Aug.29'58,p19).

Known results indicate in-situ combustion can create certain difficulties, including safety problems and complaints about odors.

Factors in the safety problem include: disposal of toxic, explosive gases resulting from the fireflood; handling of high-pressure air necessary to sustain combustion; the problems of high-voltage electricity if an electrical igniter is used; and protection against blowouts caused by high pressures induced by combustion.

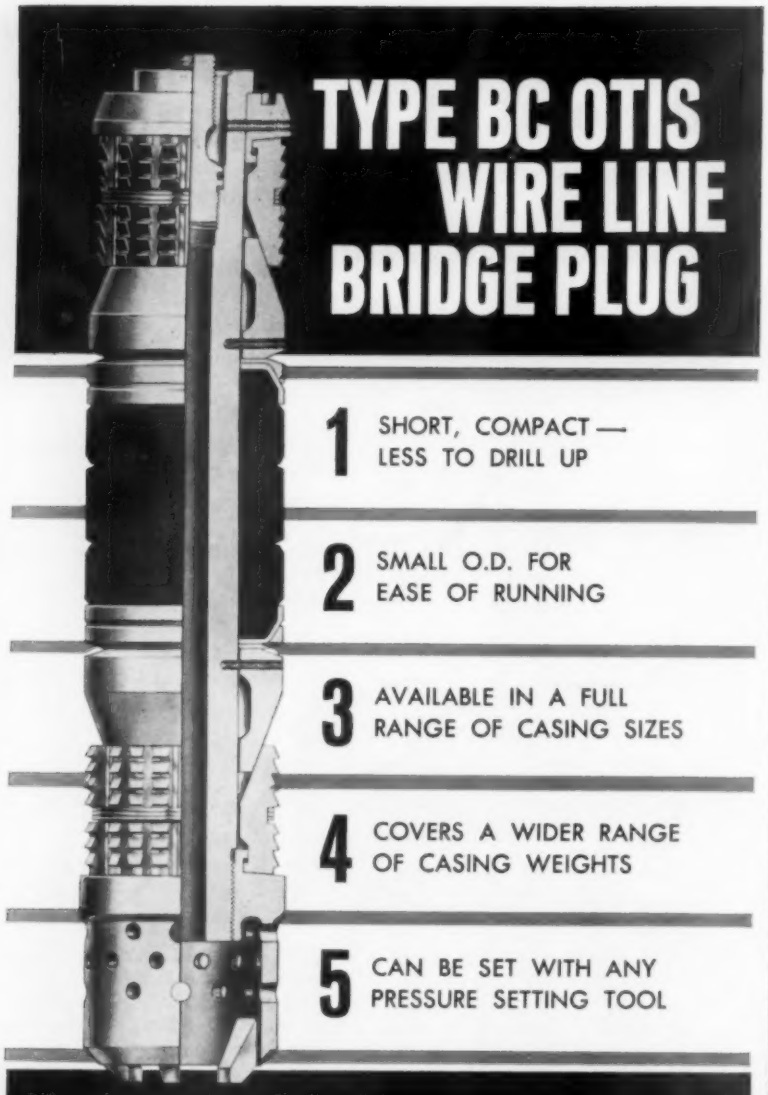
G. E. Kadane & Sons encountered difficulties when a fireflood project in Orange County brought complaints from the City of Newport about hydrogen sulfide fumes. The problem reportedly was solved by installation of a desulfurizing unit.

Corrosion proved a difficult problem in the South Belridge project. Rapid corrosion and high temperatures caused failure of conventional steel pipe and equipment above and below the surface and created a costly maintenance problem. Stainless steel pipe was said to give more satisfactory service.

In the Midway-Sunset field, Mobil Oil Co. is carrying out one of the largest thermal recovery projects ever attempted.

It involves 18 producing wells and covers a 100-acre area. Air to support combustion is being injected into one well by two compressors. Some producing wells are as far as 2,000 ft from the injection well.

Production is from the Moco sand between 2,100 ft. and 2,600 ft. The Moco was selected because its oil sands have low primary recovery and



TYPE BC OTIS WIRE LINE BRIDGE PLUG

1 SHORT, COMPACT — LESS TO DRILL UP

2 SMALL O.D. FOR EASE OF RUNNING

3 AVAILABLE IN A FULL RANGE OF CASING SIZES

4 COVERS A WIDER RANGE OF CASING WEIGHTS

5 CAN BE SET WITH ANY PRESSURE SETTING TOOL

Every time you specify the Type BC Otis Wire Line Bridge Plug, you get 5 plus features designed to help you take the guesswork out of your plugging operations—and yet the plug costs you no more than an ordinary plug. For this reason, many operators have standardized on the Type BC. They found they could successfully run the Type BC where other plugs failed to get down. In addition to the 5 big advantages you get with a Type BC Bridge Plug, you will find it's available from leading electric line service companies and stocked in over 200 different field locations — wherever you need it. Take the guesswork out of your plugging operations — the next time you need a bridge plug, specify Otis.

Type BC Otis Wire Line Bridge Plugs are available in these sizes:

SIZES	CASING WEIGHTS	SIZES	CASING WEIGHTS
2⅞"	6.4 — 8.6 lb.	5½"	13 — 20 Lb.
4½"	11.6 — 15.1 Lb.	6⅝"	17 — 24 Lb.
4½"	9.5 Lb.	7"	20 — 38 Lb.
5"	18.0 Lb.	9⅝"	43.5 — 53.5 Lb.

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leave a large amount of oil in place, a condition typical of many heavy oil sands in California.

The bulk of the oil that is burned as fuel is coke and heavy residuum, the least valuable part of the crude.

The operator has not released any information on the results to date.

Mobil also has a smalll project under way in the San Ardo pool.

An 11-acre test is being conducted in the Aurignac sand of Upper Miocene age in section 6-23s-11e in the Superior area of the pool. Ignition was started in December, 1959, at approximately 2,500 ft. in coarse-grained, friable sand that normally produces 12-gravity oil. Five wells are involved, including one injector and four producers. No results have been released.

In the West Newport area, G. E. Kadane & Sons is conducting a project that in some quarters is described as perhaps being on the way to becoming the first commercial fireflood in California.

An indeterminate number of wells are involved in the project, which is under way on the Banning lease in section 20-6s-10w. Existence of the flood, believed started in 1958, first came to the public attention when the City of Newport Beach complained about the hydrogen sulfide odors.

Another active project is in the Santiago area of the Midway-Sunset field, where Gulf Oil Corp. of California is reported to be experimenting with a reverse burn.

The company initiated field work last October with the drilling of an 871-ft. well in which 7-in. casing was cemented at 739 ft. The well then was notched and injection begun late in October.

In December Gulf drilled a 681-ft. well 120 ft. northwest of the first well, notched and fractured at 597 ft., and began injecting.

The burn is in tarry sand that produces approximately 14-gravity oil. Site is the I. M. Woodward, USL lease in section 21-11n-23w.

Another fireflood may be coming up near McKittrick field in Kern County, where the La Brea Corp. is reportedly trying to gain information by drilling eight coreholes in sections 16 and 17-30s-22e. This is believed a possible preliminary to initiating combustion in the Amnicola sand of Pleistocene age at about 1,000 ft. The sand has given up some 12-gravity oil.

Four of the six fireflood projects abandoned are in Kern County.

Mobil Oil Co. (then General Petroleum Corp.) at South Belridge, Kern

Official NADA records* prove

CHEVY'S HIGH TRADE-IN CAN HELP CUT YOUR FLEET COSTS!

Besides Chevrolet's low initial price and low operating cost, you can count on still another big saving at trade-in time. And you don't have to take our word for it. Check the official National Automobile Dealers Association records for yourself and see how Chevies *consistently* bring higher trade-in return than any other car in their field. Why? Because more people want Chevrolets than any other car. It's this greater demand (on both the new and used car markets) that keeps Chevy's resale value *up* to help keep your fleet costs *down*. And while you're at it, check your dealer on all the people-pleasing improvements in the new Chevrolets that not only make them better cars for business—but a better bet for higher trade-in in the years to come. ... Chevrolet Division of General Motors, Detroit 2, Michigan.

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*Based on prices in the National Automobile Dealers Association 1961 USED CAR GUIDE, recent-model Chevrolets are now bringing a higher percentage of their original price than any other full-sized car in their field.

County, utilized four producing wells in a pilot operation based on laboratory and small-scale field work. The project was conducted between 1956 and 1958 in township 28s, spilling over into 29s, range 21e.

California Research Corp., subsidiary of Standard Oil Co. of California, conducted a project of fee property in the Midway-Sunset field, Kern County, starting combustion in July, 1956, and discontinuing it in May, 1957. The burn was in a sand that produced 20-gravity oil from approximately 2,000 ft. A four-well pattern was used. No results were released.

Another project, reportedly a one-well test, was conducted by Humble Oil & Refining Co. in the Pleito pool, Kern County. Combustion was begun in 1959 in a well on section 35-11n-21w and ended six months later in 1960. The burn was in the Santa Margarita zone, which produces 13-gravity to 20-gravity oil from 4,300 ft. Results have been reported, unofficially, to be encouraging.

Shell Oil Co. experimented with a one-well burn in the White Wolf area of Kern County, 25 mi. south of Bakersfield, in an attempt to get commercial production from the Reef Ridge sand of Upper Miocene age. The burn was conducted last year in section 5-10n-21w at 3,700 ft. in sand that produced 14-gravity oil. Combustion has been discontinued. Results have not been released.

Standard Oil Co. of California initiated combustion in the Surf zone of the Huntington Beach area, Orange County, in December, 1958, terminating in January, 1960. Six producing wells and one injection well were involved in the 90-acre project in section 13-6s-11w. The burn was in a sand, at approximately 4,300 ft., that normally produces 20-gravity oil.

Richfield Oil Corp. (L.A.) in 1956 initiated a pilot project in the Sisar-Silverthread area of the Ojai pool, Ventura County, reportedly conducting the burn in sand near the 1,000-ft. level. It is reported also that Richfield experienced some difficulty in maintaining combustion. The project was in section 14-4n-22w.

Firefloods Operable in Limestone, Too

In-situ combustion should work as well in limestone reservoirs as in sandstone, experiments indicate.

That is the conclusion of two University of Oklahoma scientists who found thermal recovery techniques can be adapted equally well to limestone and sandstone from a purely mechanical standpoint.

Leland C. Marchant and Donald E. Menzie conducted their experiments at the university's petroleum engineering school.

Only one in-situ project has been attempted in a limestone reservoir, as far as Merchant and Menzie were able to determine. That was by the California Oil Co. in the Irvine-Furnace field, Estill County, Ky. It was abandoned several years ago.

Thermal projects form one of the most effective means of secondary recovery, if correctly employed, Marchant said.

Operators have shied away from fire-flood attempts in limestone reservoirs because they have lower oil saturation than sandstone reservoirs, among other reasons.

Marchant said the present experiments were occasioned by "numerous unanswered questions as to the feasibility of conducting in-situ combustion in limestone reservoirs and the physical rock changes which would occur under elevated temperature conditions."

Changes occurring in fireflooding are basically the same in limestone and sandstone, Marchant said.

In their investigations, Marchant and Menzie carried out laboratory tests to determine characteristics of rock samples before and after subjection to high temperatures.

Rock samples were obtained from 4-in. cores supplied by a major oil company from wells in several sections of the country. Selections were made to assure a considerable latitude in porosity, impurities, color, and consolidation.

Properties measured before and after burning included weight, effective porosity, permeability to air, and state of decomposition. A Boyle's Law porosimeter was used to determine porosities; linear dimensions were measured with a micrometer, and weight with an analytical balance. Permeability was calculated by Darcy's equation, following measurement of air flow through the sample enclosed in a core holder.

Rock samples were heated to temperatures between 1,000F and 1,500F for the experiment, with most observations recorded following baking at 1,200 F. This is believed to be approximately the temperature present in reservoirs subjected to firefloods.

Samples were removed to air-tight containers following 24 hours of baking, allowed to cool, then measured.

Baking at high temperatures produced porosity increases up to 703% and other significant changes in limestone samples.

Weights decreased by 30% to 50% and permeability to air showed gains of up to 250%.

The limestone was quite incompetent (not flexible or sufficiently firm to transmit a thrust) after burning, and the condition increased with time.

Temperatures around 1,300F were required to break down pure limestone, but lower temperatures broke down limestones having excess free carbon and other impurities.

Dolomitic rocks tended to break down at temperatures of approximately 1,000F, lower if sulfur was included as an impurity.

Limestone and dolomitic rocks were observed to supply fuel themselves at high temperatures in the form of free carbon, carbon monoxide, and oxygen.

In-Situ Project Advances in Oklahoma

Work is reported progressing smoothly at Sinclair Oil & Gas Co.'s tertiary thermal recovery project in the Delaware-Childers pool, Nowata County, Okla.

The project is aimed at testing the economy of a fireflood in a watered-out reservoir. It is being carried out on a 3,074-acre tract, though the first phase of the project, ignition in a sand underlying a 2.2-acre pilot tract, began late last year.

It's estimated that of the 85.5-million bbl. of oil originally in place in the reservoir—the Bartlesville sand at around 650 ft.—better than 50% still remains, despite subjection of the 50-year-old pool to a series of primary and secondary recovery techniques (PW—Mar.10'61, p27).

At last report, no "kick" had yet been obtained from the initial air injection phase, with the amount of air injected to support combustion totaling 830,000 cf/d.

McCULLOUGH
SALINITY LOG
with scintillometer®
...a nuclear log that tells
OIL *from* SALT WATER

The McCullough Salinity Log determines the presence and degree of saline fluids in formations surrounding the bore-hole. It will distinguish between oil and salt water and can be used in open or cased hole. Providing hole diameter is not extreme, it may be used where air or gas or highly saline fluid was used for drilling.

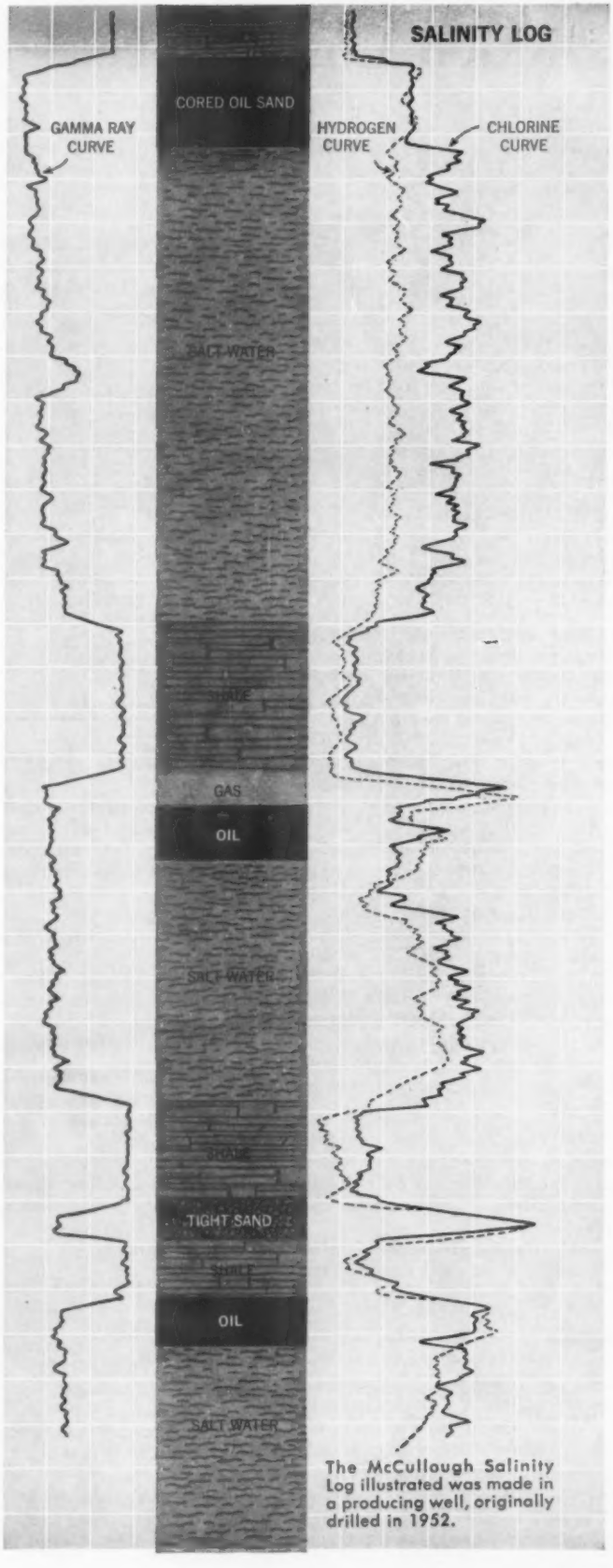
A "chlorine" curve and a "hydrogen" curve are recorded simultaneously at the same depth elevation with a single detector. These curves are compared to indicate the amount of salt, NaCl in particular, that is present in the formations being investigated. In potential oil bearing formations the absence of salt is indicative of the presence of oil.

The recording of the two curves simultaneously is considered essential. It eliminates the possibility of a depth discrepancy between two curves which are recorded separately. It also insures the recording of information under identical physical conditions—of extreme importance in interpreting the two curves.

A higher counting rate and greater instrument efficiency allows an increased spacing (23¾ in.) between the source and the Scintillometer. This provides the added benefit of a proportionately larger zone of investigation.

Take a look at these features:

- **Distinguishes between salt water and oil in liquid bearing formations.**
- **Determines the degree of salinity in formation fluid.**
- **Identifies salt water zones that must be blanked off.**
- **Makes possible water saturation calculations for potential oil bearing zones.**
- **Shows salt water and oil zone contact under suitable conditions.**
- **Aids in determining gas/oil contact.**
- **Helps determine if it is economically practical to set casing on new completions.**
- **Aids in evaluating correct depth to set casing string.**
- **Accurately re-evaluates old wells to locate potential cased-off production.**
- **A reliable tool for porosity determination.**



The McCullough Salinity Log illustrated was made in a producing well, originally drilled in 1952.

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'Hidden Costs' Threaten Exploration

A Denver petroleum consultant says that domestic exploration must discard tradition-bound methods of cost-cutting or face the prospect of "economic suicide" within five years.

D. M. E. McLarty sounded the warning this week at the 14th annual Midwestern Exploration meeting of the Society of Exploration Geophysicists in Oklahoma City.

McLarty said that if activity continues to decline at its present rate, domestic exploration by 1965 "will have passed the point of no return and never again be an important source of new oil.

"Other sources and other well-finding methods will have supplanted exploration permanently."

McLarty added this need not happen, provided "100 years of tradition" are junked in searching out and eliminating deep-rooted, hidden cost sources.

Fresh concepts, quantitative planning, and objective organization—all pointed at making money by finding oil—are what is needed today, the Denver consultant maintains.

McLarty said that today's technology makes exploration a production-type business. "Its finished product is a producing oil field, and its raw materials are ideas," he said. Its basic physical unit is a prospect.

He noted that in exploration's "production line," the prospect goes through four processing phases: (1) exploration generates and develops ideas to find prospects; (2) it processes and evaluates prospects to find drillable prospects; (3) it drills drillable prospects to find oil-bearing prospects; and (4) it develops oil-bearing prospects to manufacture the finished product—a fully developed producing oil field.

The objectives of the exploration man, he continued, can be expressed in a formula that can be calculated quantitatively "with usable accuracy."

McLarty said the exploration man "wants to make predetermined profit P by finding A prospects of quality J, which will yield B drillable prospects of quality K, which will yield C oil-bearing prospects of quality L, which will contain X reserves; all for an expenditure of Y dollars in time Z.

"With the single exception of J, all the above factors can be calculated quantitatively with usable accuracy."

Quality-control standards must be determined, he said, and inspection units established for each separate phase of the exploration operation. He added that quantity control must be maintained by programming the rate of flow of each phase of exploration activity.

To activate this concept of economics and management of domestic exploration, he said, "exploration must change its archaic form of organization."

Exploration, he contended, "must junk its present geology, geophysics, and land departments where workers are grouped on the basis of the nature of their work, and regroup workers on the basis of the purpose of the work a man does."

The new "objectively designed" exploration department would have seven functions, the consultant said.

These functions are: (1) management; (2) planning and economics; (3) records and information; and four operational functions: (1) acquisition; (2) processing and evaluation; (3) manipulation; and (4) drilling and development.

Each function is performed by a separate and independent group of workers, McLarty explained. Three of the operating functions perform the four producing phases of exploration.

With these principles, which McLarty categorizes as "Geonomics," and with quantitative planning and objective organization, "all factors which contribute to exploration costs may be controlled, waste and duplication eliminated, and effectiveness increased, "certainly to the extent that domestic oil can be found profitably and exploration compete successfully with other oil-finding methods.

"And quite probably to the extent that the 70% profit gap which presently exists between domestic and Middle East crude delivered on the Atlantic seaboard can be closed."

In Texas Gulf Coast . . .

Water Limits Drilling With Gas

An initial effort to drill with gas in the Texas Gulf Coast has led Mobil Oil Co. to conclude that such drilling has limited application in the area.

Mobil made the conclusion after drilling a wildcat some 75 mi. inland from the Gulf. The company feels, however, that gas drilling may have some applications in Southwest Texas. Gas drilling has become relatively widespread in other areas.

Water problems on the Texas Gulf Coast will prevent operators from drilling with gas except in dry formations, says Mobil.

"We will not be able to use gas for any sustained drilling operation on the Gulf Coast," a Mobil engineer said. "We would constantly be switching between mud and gas."

Mobil drilled more than 1,200 ft. with natural gas in a deep Lavaca County test.

The No. 1 Jim Orsak, Jr. was drilled to 14,500 ft. and abandoned. Gas used in drilling a part of the hole came from another well in the area.

The company used mud in drilling to 10,001 ft. At that point, Mobil set and cemented 9⅝-in. casing. The mud was displaced with fresh water, and the water then displaced by gas.

Drilling proceeded until 10,752 ft. was reached, at which level the bit stuck in the lower Wilcox formation. Mobil switched to mud and the hole was sidetracked.

Gas drilling was resumed at 13,212 ft. At 13,730 ft., the test hit a wet formation and flooded. Mud was then used to total depth.

Mobil estimates that its gas drilling increased penetration rate to 60 ft. per hour.

This compares with an average 3.5 ft. per hour with mud, the company notes. One spokesman says the gas drilling penetration rates could have been even greater but "our people were feeling their way."

Because only 1,269 ft. of hole was drilled with gas, the company was unable to determine any other savings.

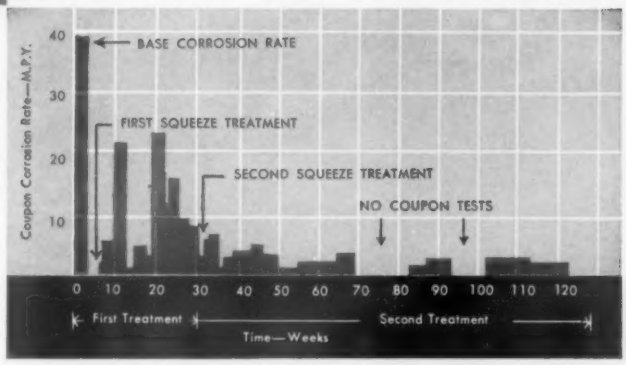
While Mobil has no present plans to try gas drilling further on the Gulf Coast, the company notes there is the possibility of such drilling in the Edwards formation.

"We still think there is a possibility of gas drilling in special formations, such as the Edwards, in the offing on the Gulf Coast," says a Mobil engineer.

"The Edwards, particularly, is relatively dry and should not present the flooding problems encountered in other coastal formations."

another

TRETOLITE SERVICE report



Corrosion history of a West Texas well, showing coupon corrosion rate with time

KONTOL *puts the squeeze on corrosion*

Results at a West Texas well show why the KONTOL* Corrosion Inhibitor squeeze technique is rapidly gaining favor with producers everywhere. Located in Crane County, this well is completed in San Andres pay at 3,500 feet. Production rate is 70 bbl. per day, with just a trace of water. It was decided to try KONTOL inhibitor squeeze after coupon testing showed a corrosion rate of approximately 39 m.p.y., and rods were beginning to pit.

KONTOL *treating is simple*

Inhibitor squeeze treating began by pumping a mixture of 30 gallons of KONTOL dispersed in 100 bbl. of crude oil into the formation through the casing-tubing annulus. This was followed by a 100 bbl. crude oil overflush. Surface pressure was approximately 1,000 psi during the squeeze. Following this treatment, the well was closed for 20 hours.

KONTOL *results are positive*

During the first five months following treatment, the corrosion rate varied from a high of 21 m.p.y. to a low of 0.5 m.p.y. For 11 weeks of this period the rate was below 5.0 m.p.y. No equipment failures due to corrosion were reported during the five-month period.

KONTOL *protection is long-lasting*

Six months after original squeeze treatment the corrosion rate was still satisfactory, but it was decided to resqueeze the well to make certain of uninterrupted protection. During the following 90 weeks, coupon tests showed a corrosion rate that averaged 2.0–3.0 m.p.y.—proof of KONTOL's enduring effectiveness.

Ask the Man in the Red Car to explain how KONTOL *Corrosion Inhibitor squeeze treating offers advantages over conventional batchtreating methods. Let him prove why* KONTOL *can be applied more easily and economically, with lasting results.*

*Registered trademark, Petrolite Corporation

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FA-60-3A

The 'Mule' Cuts Handling Costs in

HYDRAULIC MOTORS operate jaws of "Mule." They connect to gear pump.

A drill collar handling device, dubbed the "Mule," has cut costs by improving efficiency of tripping operations for Imperial Oil Ltd.

The standback device has been used by the company for the past year, with reportedly good results. It was developed by Imperial's L. W. Wooldridge, and fabricated by Barber Machinery Ltd., Edmonton.

The unit was first placed in service on Imperial's National No. 6 Rig, in drilling No. 10-31 Chungo, lsd 10-31-44-19w5, in the foothills of southwest Alberta. The test has since been abandoned.

Tripping time was reduced an average of 28 minutes per trip by use of the "Mule" on one test.

A company report says that the time saving was made in the handling of twenty 6¼-in. and three 7-in. drill collars.

This represented a saving of an estimated 3½ days of rig time, or $5,280, in drilling from 5,422 ft. to 11,000 ft.

The approximate $4,000 cost of the "Mule" was, therefore, paid off on this one job, with a net over-all saving of $1,250.

Imperial says the saving in drill collar handling time and cost would be proportionately higher when using larger diameter drill collars because of the greater collar weights and increased handling difficulties.

Further, the company adds, it's estimated that cost of similar drill-collar handling devices may be reduced even more with improvements in design and elimination of prototype costs.

The "Mule," basically a telescoping steel arm with jaws, is hydraulically driven and controlled from one side of the derrick, at the monkey board.

The hydraulic system is driven by a 3-hp. electric motor connected to a low-pressure hydraulic gear pump.

The device itself is controlled by three levers set in a panel at the monkey board. The levers are connected to three-way valves, with six adjustable flow-control valves to control rate of fluid discharge and, consequently, speed of each function.

The levers control three separate movements:

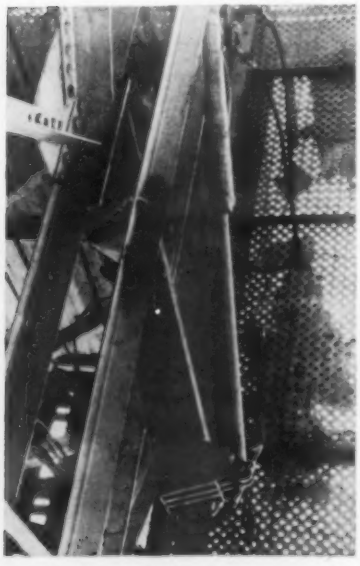
(1) The telescopic arm is operated by a double-acting hydraulic cylinder which permits extension or retraction of the arm.

(2) The double-acting hydraulic cylinder swings the "Mule" in a horizontal plane about the hinge pin.

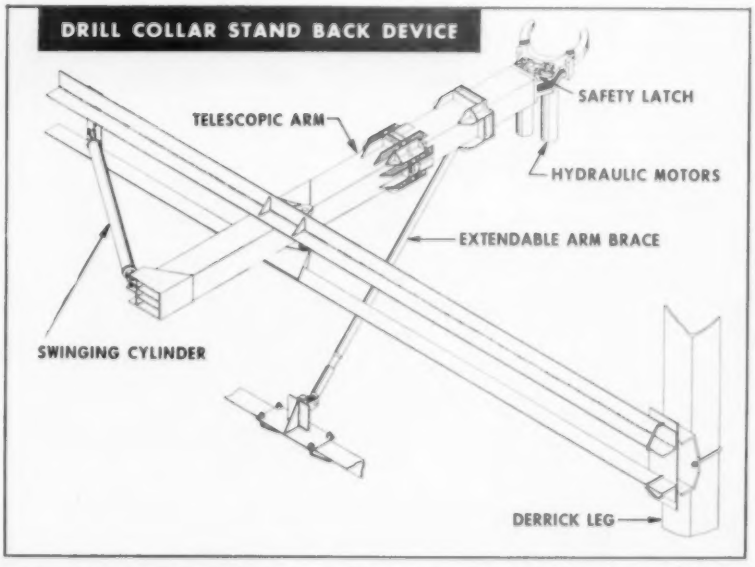
(3) The third lever controls two slow-speed high-torque motors that open and close the jaws.

Jaws presently installed on the "Mule" can accommodate drill collars ranging in size from 6¼ in. to 9 in. in diameter.

Hydraulic hoses tested to 2,000 psi. and equipped with quick-release, self-



SWINGING CYLINDER, in extended position, swings "Mule" horizontally.



PRINCIPAL COMPONENTS of the drill collar standback device developed by Imperial Oil Ltd. are shown in this schematic. The unit was fabricated at a cost of $4,000.

Tripping Operations

sealing couplings are used to connect valves to the gear pump, cylinders, and hydraulic motors. Two different sized couplings are employed to prevent any mixups during reassembly of the hoses.

Safety for crewmen also has been increased by use of the device.

A device to prevent unintentional release of drill collars in case of pump or hose failure is incorporated in the "Mule." This device consists of a spring-loaded latch that prevents jaws of the telescoping arm from opening until the latch is released by the derrickman.

Personal safety also has been increased, especially in the handling of large-diameter drill collars, because no straining is necessary.

In addition, the safety latch on the jaws of the mule prevents the premature release of drill collars, and thus any possible damage from drill collars falling across the derrick.

While the "Mule" presently is installed on a derrick, it can be adapted to masts.

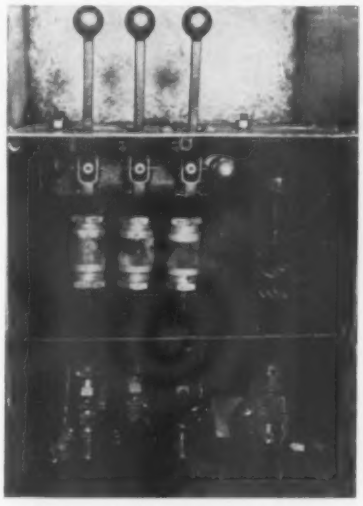
Imperial's National No. 6 Rig is equipped with a 147-ft. Lee C. Moore type K conventional derrick with a 30-ft. base.

The "Mule," located approximately 6 ft. directly below the monkey board, has a maximum sweep of 9 ft. from the derrick.

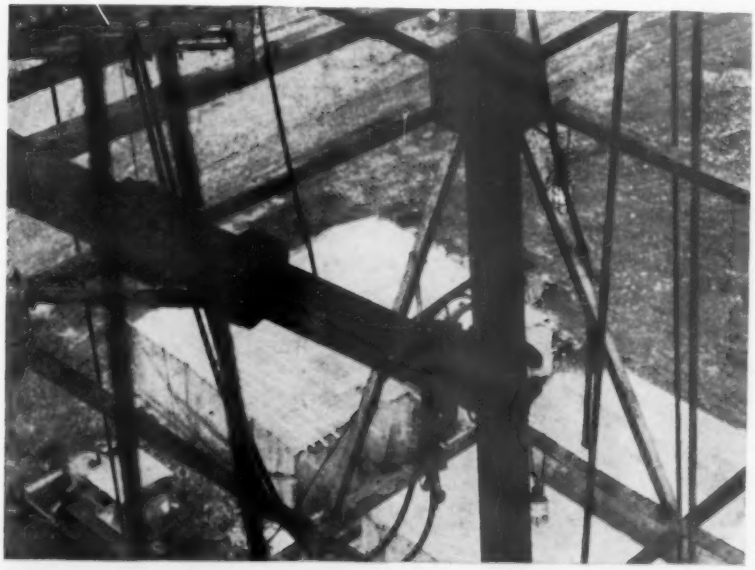
On a standard mast, the arm would have to reach approximately 6 ft. in order to rack drill collars appropriately.

Imperial says the device could be adapted to masts by shortening the telescoping arm and swinging arm cylinders, and by reducing the size of the telescoping arm cylinder. No other design changes should be necessary.

Imperial adds that Wooldridge has been associated with all of the company's major developments in Western Canada for the past 25 years.



LEVER CONTROL SYSTEM is set in panel located below the monkey board.



"MULE" IN OPERATION shows how a stand of drill collars are moved during a trip. The device has a sweep of 9 ft. from the derrick, but can be adapted for masts.

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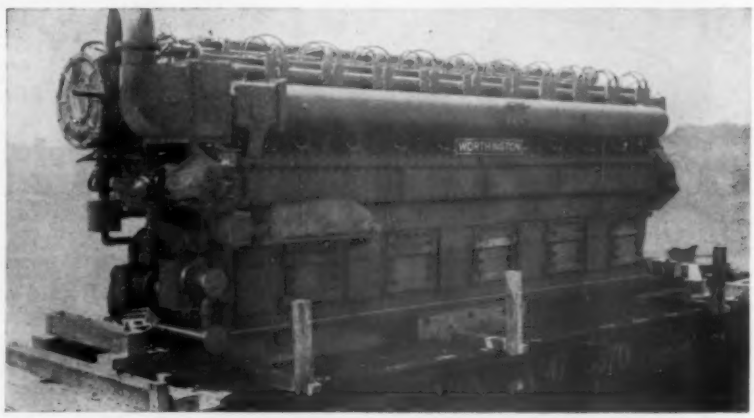

Above, Worthington SLHC-10 gas engine compressor as it was being prepared for gas-lift service at the Ventura, California, oil field of Shell Oil Company. This unit is self-contained, with multi-purpose radiator for jacket water, lube oil and gas cooling, filters, starting air system, pulsation bottles, scrubbers, piping and controls all mounted on a structurally engineered skid. Right, one of the two "re-ordered" SLHC's that confirmed the acceptance of the first unit.

WORTHINGTON SLHC'S

What's the best proof of satisfactory performance of a gas-lift compressor? Certainly, there's none better than re-orders by a producer that owns one already.

Just recently, Shell Oil Company ordered, not one, but two more Worthington SLHC gas-engine compressors—both are duplicates of the first one installed in their oil field at Ventura, California.

The first ten-cylinder SLHC went on outdoor service in the Fall of 1958. It is designed to operate over varying conditions with suction from 50-70 psig and discharge from 700 to 1500 psig on wet hydrocarbon gas. Manual capacity control on the first of the unit's three stages permits full loading over varying pressure ranges.

This turbocharged unit is directly responsible for the oil production out of 16 to 17 wells on a 24-hour a day basis—frequently under overload conditions. The two new units will be given similar assignments.

Here are some of the factors that resulted in lowest evaluated cost at the time of the first SLHC purchase: lowest guaranteed fuel rate (7000 BTU/BHP/Hr.), largest capacity of gas handled by a single skid-mounted unit, smallest cooler size because of lowest heat rejection rate (2020 BTU/BHP/Hr. total), and lowest maintenance because of the conservative rating made possible by turbocharged design.

For complete information on the SLHC gas-engine compressor, contact your nearest Worthington District Office. Or write Worthington Corporation, Section 43-21, Harrison, N. J. In Canada, Worthington (Canada) Ltd., Brantford, Ontario.

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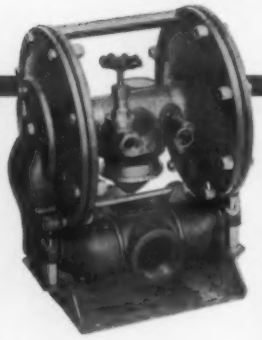

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What's New / IN PRODUCTION

Operators Assess Damage In California Quake

Operators are still trying to determine what action to take following a deep-seated earthquake that damaged 50 wells and cut production by more than 1,000 b/d in California's Wilmington pool.

Estimated cost of redrilling the damaged wells is $50,000 to $75,000 per well, while drilling new holes would cost from $75,000 to $100,000 each. Some damaged wells may not be put back in production, however.

First indication of the damage came when wells that were pumping with rod pumps suddenly stopped, indicating the pipe had collapsed.

Damaged in the Apr. 4 earthquake were 33 wells owned by Union Pacific Railroad Co., 12 owned by the City of Long Beach, and four owned by Atlantic Oil Co., and one owned by Mobil Oil Co. All stopped producing. A water injection well owned by Union Pacific also was damaged.

The quake was estimated to have taken place at a depth of approximately 10 mi. Slippage occurred above 2,200 ft., but there was no surface damage.

In five previous earthquakes, slippage above the 2,200-ft. level caused the earthquake. The most extensive damage was in 1949 when 200 wells were damaged.

•

Mecom Deep Test Approaches 20,000 Ft.

John W. Mecom Unit No. 1-S LL&E, Plaquemines Parish, La., has passed the 19,000-ft. depth mark.

A log run to 18,932 ft. showed bottomhole temperature had risen to 275 F. A 17.8-lb. mud is being used presently. A new log will be run when the venture is carried below 20,000 ft. Operator is prepared to go to 26,000 ft., which would be a depth record (PW—Feb.24'60,p34).

•

The Texas School Land Board and other mineral lease boards are contemplating a lease sale in July or August, if there is sufficient interest.

Land Commissioner Jerry Sadler says persons interested in bidding for state oil and gas leases should make nominations to him by Apr. 30, so he can determine if there is sufficient interest to justify the sale.

•

Union Texas Natural Gas Corp. and Frankfort Oil Division of Joseph E. Seagram & Sons have completed acquisition of the producing and undeveloped properties of Anderson-Prichard Oil Corp. for $123-million.

The transaction was completed Mar. 31, but made effective as of Nov. 1, 1960.

•

The board of Canadian Devonian Petroleums, Ltd, has recommended acceptance of the offer by British American Oil Co to buy all oustanding shares at $5.10 per share.

The British American offer would involve $17.5-million.

•

Three sales of oil and gas leases on Indian lands in Montana, North Dakota, and Utah, will be held late this month and early next month.

The Ft. Berthold Indian Agency will hold a sale Apr. 27 at New Town, N. D., of three tribal tracts, totaling 361 acres, and 103 tracts of individually owned trust or restricted lands, consisting of 25,000 acres in Dunn, McKenzie, and Mountrail Counties.

Nearly 35,000 acres of Uinta Basin acreage are being offered for oil and gas leasing at a sale May 2 at the office of the superintendent of the Uintah and Ouray agency in Ft. Duchesne, Utah. The offering consists of 61 tracts of tribal land, consisting of 31,400 acres, and 41 tracts of allotted lands, comprising 3,530 acres.

The Ft. Peck agency in Montana will sell 27 tracts of tribal lands, totaling 2,394 acres, and 341 tracts of allotted land, amounting to 32,080 acres, at a May 2 offering. The lands are in the Tule Creek area and along the Montana-North Dakota line near the Dyer area.

•

The Mar. 29 sale of oil and gas leases in British Columbia brought a total of $1,526,604.

The provincial government accepted bids on 26 parcels, amounting to 145,-

759 acres, in the northeastern part of the province. Twelve other parcels were withdrawn.

French Petroleum Co. of Canada, Ltd., bid $235,578 for 350 acres in the Boundary Lake area, to top the per-acre bidding.

•

A sale of oil and gas leases in Nebraska Mar. 31 brought a total of $83,410 for 18,440 acres. Cabot Carbon Corp., Pampa, Tex., paid a high bonus of $9 per acre for a full section in Frontier County. All 33 tracts offered were leased.

•

Operators estimate they will recover an additional 2.3-million bbl. of oil from the West Sandusky pool, Grayson County, North Texas, through a unitized pressure maintenance program.

In an application to the Texas Railroad Commission, L. O. McMillan, as unit operator, estimated only 950,000 bbl. could still be produced by primary recovery methods. Estimated original oil in place was 10.75-million bbl.

•

The California State Lands Commission has received a bid of $1,355,111 for an offshore parcel off Santa Barbara County.

A group composed of Richfield Oil Corp. (L. A.), Ohio Oil Co., Mobil Oil Co., and Tidewater Oil Co. made the bid for Parcel 3, consisting of 4,250.14 acres. Texaco Inc. offered $425,000 in the only other bid submitted.

•

Engineering

Interchangeable hangers in the same casing head are provided in a new line of wellhead equipment for tubingless completions.

Manufactured by ALCO Products, Inc., Beaumont, Tex., the development permits hanging of single or multiple tubing strings either by slips or threaded mandrels. Only slips and packing element are necessary to change from threaded to slip suspensions. Single, dual, and triple completions can be accomplished with 12-in. casing heads.

•

A line of compact V-type pumps for the 75-hp. to 350-hp. range is now available from W. R. Barry Pump Co., Tulsa.

The V45 series supplements the company's V60 models, which operate in the 300-hp. to 1,250-hp. range. The V45 is available in six models on three frame sizes.

•

A thermoplastic material has been used almost exclusively in the construction of a gear pump designed for high corrosion resistance.

Planet Products, Chicago, uses DuPont "Delrin" acetal resin in fabricating all major parts. The maker says tests indicate the plastic design reduces horsepower requirements, offers prolonged service, and cuts maintenance costs.

Design capacities range from 69 b/d to 635 b/d, and each pump is designed to operate at pressures up to 100 psi. The pumps are said to be especially suitable for salt-water disposal systems and for wells with high salt-water-to-oil ratios.

•

Drilling Highlights

West Texas—Jim B. Curry No. 1 Fred Spreen, C. W. Witt survey, flowed 289 bbl. of 41-gravity oil in 8 hours through 20/64-in. choke and perforations at 3,772-84 ft. in the Gardner sand (Pennsylvanian). It is situated 1 mi. to the south of deeper Gardner production in South Cora Byers pool.

In Martin County, Husky Oil Co. et al No. 1-A Hill, section 62, block A, Bauer & Cockrell subdivision, was completed for 247.2 b/d of 36.2-gravity oil, plus 2% water, through 20/64-in. choke and perforations at 8,462-502 ft. in the Dean (Permian). It is 10 mi. south of the Modesta pool.

California—Occidental Petroleum Corp. No. 1 Standard Browning, section 19-16n-1e, Sutter County, flowed 2,271,000 cf/d of gas through 15/64-in. choke to open West Butte gas field, 4½ mi. northwest of Marysville Buttes gas field. Production is from F-Zone sands of Cretaceous age at 5,688-702 ft., 5,777-98 ft., 5,810-31 ft., and 5,843-49 ft.

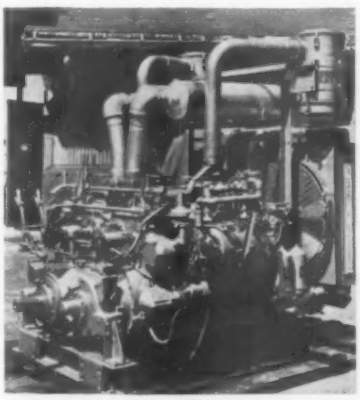
In Kern County, Richard S. Rheem, No. 11X-34 Norris-KCL A, section 34-30s-26e, flowed 168 b/d of high-gravity oil through 14/64-in. choke and perforations in the Lower Stevens at 9,018-42 ft., 9,056-62 ft., and 9,072-85 ft., a new pay for the Canfield Ranch field.

South Louisiana—California Co. et al No. 1 State Lease 3,660, Bastian Bay, Plaquemines Parish, was completed for 163 b/d of 29.9-gravity oil through 7/64-in. choke and perforations at 10,291-302 ft. The oil pool discovery, only the second so far this year in the state, as against 11 gas fields, is situated 1½ mi. to the east of the Manila Village pool, across the line in Jefferson Parish.

British Columbia—Western Natural Gas Co., Inc., No. 3 Petitot A-81-L, 1¾ mi. southeast of the company's No. 2 Petitot River, was completed for 10¼-million cf/d of gas through ½-in. choke and perforations in the Slave Point Middle Devonian.

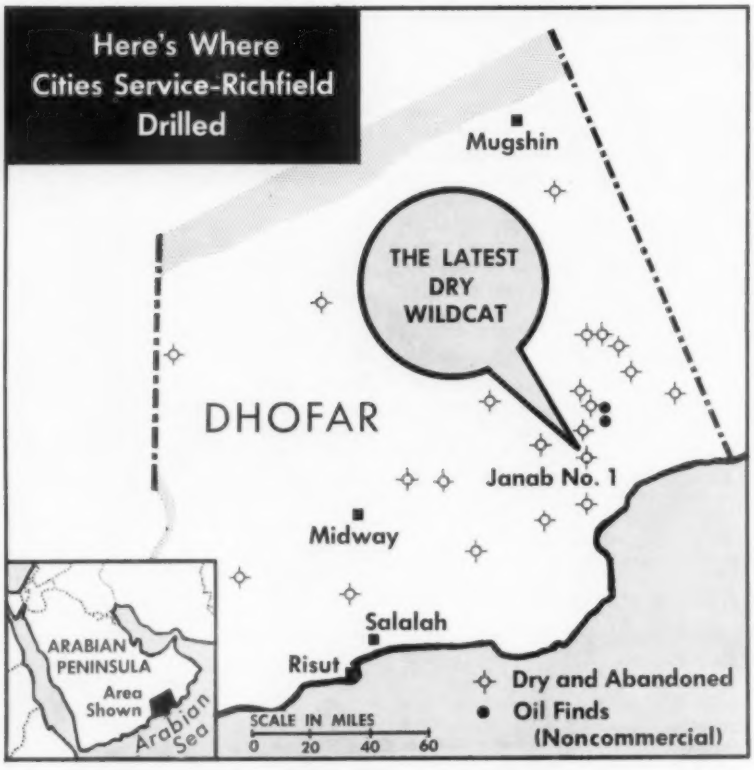
North Texas—A. R. Dillard and Kewanee Oil Co. No. 1 Louis Hrncirik, section 137, T&NO survey, was completed for 117 b/d of 37-gravity oil, plus 10% water, through 14/64-in. choke and perforations at 5,063-73 ft. in the Strawn (Pennsylvanian). The well is 5 mi. northeast of a county regular field.

Montana—Shell Oil Co. and Northern Pacific Railway Co. No. M-12-15 NP.C., section 15-9n-58e, Fallon County, was completed for 369 b/d of oil on the pump and some water through perforations at 7,283-305 ft. in the Mission Canyon sand, new pay for the Monarch area.



Kit Converts Diesel To Gas Operation

This General Motors Series 71 Diesel engine can be converted to natural gas, spark-ignited operation in four to five hours. Stewart & Stevenson Services, Inc., Houston, reports the converted engines have been field-tested. The conversion kits enable an operator to use the same engine for operation on either straight natural gas or as a full Diesel, whichever is most economical. The kits include an exchange cylinder head complete with spark plugs and adaptors, a natural gas carburetor with attaching adaptor for installation on engine blower, and five other devices needed for conversion.



Cities Service, Richfield Suspend Search in Dhofar

But firms will not give up their concession there.

Cities Service and Richfield have suspended exploration activities in Dhofar, but they will not give up their concession there, a spokesman for the former company said last week.

Dhofar-Cities Service Petroleum Corp. holds rights to the whole of the 32,000-sq. mi. province of the Sultanate of Muscat and Oman on the southern coast of the Arabian Peninsula (map). It is the operator on the acreage. Richfield has a 50% working interest in the concession.

The suspension comes shortly after the abandonment of the 23rd test drilled by Cities Service. The No. 1 Janab wildcat reached 7,399 ft. before being plugged.

Since drilling began in 1955, both shallow and deep tests (the deepest over 12,000 ft.) have been drilled in widely separated sections of Dhofar. The exploration effort has been most intense, however, in the eastern region of the desert province.

Cities Service has two rigs in Dhofar, a heavy rig and a light one. The relatively shallow tests of recent months have been drilled with the latter.

Despite the disappointments of the past, the companies still are interested in Dhofar, and they may drill another test in the future.

The Cities Service spokesman said the area still has untested structures that are potentially oil-bearing. Because of this, the companies are by no means ready to pull out at this time.

The 10-year exploration period ends in 1963.

A decision on future operations will depend upon a study now being made.

The operator last month completed an extensive refraction seismic program, and the data acquired are currently being evaluated by the companies.

Four years ago the companies had what appeared to be a valuable oil discovery in Dhofar. But the appearance turned out to be deceiving.

Drilling on the 11-mi.-long, 5-mi.-wide Marmul structure in eastern Dhofar, Cities Service completed two oil wells, each at first believed capable of producing 2,000 b/d of 22-gravity oil.

The discovery was later labeled noncommercial, however, when the production rate started declining rapidly. A third hole on the structure proved dry.

Oil shows have been found in other Dhofar wildcats, but none of these has been completed.

The suspension of exploration in Dhofar means that the search for oil in the southern end of the Arabian Peninsula is now at a complete standstill.

The Shell Group, in partnership with the Gulbenkian interests, retained rights in the province of Oman from which other members of an Iraq Petroleum Co. affiliate withdrew. But it is not at present actively engaged in exploration.

Shell now owns approximately 85% of Petroleum Development (Oman) Ltd. The rest is held by the Gulbenkian interests through Participations and Explorations Corp. (Partex).

The firm was once an affiliate of Iraq Petroleum Co. But last year Shell and Partex took over 71.25% in total interests of Jersey Standard, Socony Mobil, British Petroleum, and the French major, Cie. Francaise des Petroles, in the Oman venture.

Three dry holes were drilled on the Oman concession before exploration activity dropped in the area to its present level.

Texaco Gives Its

New challenges to successful business operations have arisen for the oil industry out of the world's involved social and political problems, says Texaco's chief executive —who expresses confidence that they can be met at home and abroad. Here is the way Board Chairman Augustus C. Long analyzes an important issue in the international field:

"Efforts are being made today by producing countries to find some method of prorationing that would in effect guarantee the continuation of their oil revenues at present or higher levels. This is a laudable objective, but in working out

Japanese Oil May Alter Mideast Scene

(An on-the-spot report from PETROLEUM WEEK*'s Middle East Bureau chief)*

RAS KHAFJI, Neutral Zone—The rulers of Saudi Arabia and Kuwait ceremoniously pressed a button here last week that could set off a series of changes in the Arabian Gulf oil picture—besides marking the start of commercial exports by the Japanese.

The ceremonies were held by King Saud and the Sheikh of Kuwait at the new permanent onshore base of Arabian Oil Co. (PW—Mar.31'61, p51). The Japanese firm holds the undivided offshore Neutral Zone oil rights of both, Saudi Arabia's under a 56-44 profit-sharing pact, and Kuwait's under 57-43 terms that also require payment of a $5-million bonus when total production reaches 100,000 b/d.

So far, Arabian Oil has completed 12 wells in its offshore Khafji field. They can produce from 5,000 b/d to 7,000 b/d each.

One potentially significant development: The governments of Saudi Arabia and Kuwait now become the biggest single shareholders—10% each—in their mutual Japanese concessionnaire.

Each has exercised its option to acquire a 10% share in Arabian Oil's capital at par value, and each is putting up $6.9-million for its share. (The Japanese ownership is split among a large number of business and industrial interests in Japan, which formed the company to acquire the Neutral Zone offshore rights.)

Each of the two governments also has the right to appoint three directors to the company. At the moment, however, there appears to be some question whether they can spare their top oil officials for the posts.

The Neutral Zone's entire status may change now that Khafji is slated to become a new oil export center in the Gulf, with the Japanese decision to spend $70-million on permanent export facilities.

Workable administrative and judicial machinery for the virtually uninhabited Neutral Zone may be set up as one result of the state visit King Saud made to Kuwait before the ceremonies at Khafji.

The question is currently under discussion between Saudi Oil Minister Abdullah Tariki and Ahmed Sayid Omar, deputy director of Kuwait's Finance Dept. and chairman of the new Kuwait National Petroleum Co.

Kuwait has proposed demarcation of the Neutral Zone, whose limits have never been defined. It also proposes that a joint Saudi-Kuwaiti administration be set up to cut costs—for the two governments, and also for their respective oil company concessionnaires and their contractors.

(Onshore, Getty Oil Co. holds the concession for Saudi Arabia's undivided half-interest, and American Independent Oil Co. holds Kuwait's.)

The Saudis expect that the success of the Japanese venture in the offshore Neutral Zone may bring immediate pressure from other Middle East governments for changes in terms of their concession agreements. According to this view, the impact of the 56-44 and 57-43 agreements may come much sooner than anticipated abroad.

Tariki believes the first effects will be felt in Iraq, though other concessions closer to Khafji may get a jolt.

According to Tariki, Iraq will now ask Iraq Petroleum Co. for the same benefits per ton of crude exported as those from Khafji crude. He is apparently convinced the latter will be greater than those Iraq gets, despite the many uncertainties still clouding the picture—including the sales price in Japan's competitive, if potentially captive, market (PW—Apr.7'61,p44).

On the whole, the Kuwaitis—still flushed with gains made in their new concession agreement with Shell—are less excited about the Japanese venture.

Shell, says a highly placed official, offered Kuwait "effective partnership," whereas Kuwait and Saudi Arabia are "mere stockholders" in the Arabian Oil venture—which anyone could buy into (PW—Mar.17'61,p47).

The indications are that, for some time at least, Kuwait—unlike Saudi Arabia—will be interested only in the crude export phase of the Japanese venture.

The Kuwaitis are not sure that Arabian Oil, a newcomer to the business, will be able to make money on other phases—transport, refining, and marketing—and are not interested in pushing them.

This, in fact, is a major distinction between the Saudi and Kuwaiti pacts with Arabian Oil.

Saudi Arabia specifically requires international operations as an "integrated entity," with its 56% share of net profits—or losses—to be calculated on that basis.

Kuwait, on the other hand, sidesteps any specific obligation for integrated operations. In fact, to make certain that its assured 57% share of profits from crude exports will not be reduced by losses in other operations, Kuwait requires calculation of profits

Views on Oil Issues Abroad

the methods of attainment, it is vital that those countries which have fared so well under the present arrangements retain the principles necessary to success in all international commerce.

"First and foremost of these, without which no nation or company can do business with others, are those which support free enterprise in the market place and the sanctity of contracts between the participating parties.

"Consider the tremendous gains made by the oil-producing countries of the Middle East. Without having to make one cent of investment to provide the manpower, machines, or know-how, the four principal countries—Iran, Iraq, Kuwait, and Saudi Arabia—in the past ten years have received payments that have gone from $125-million to almost $1¼-billion—an increase of 900% in one short decade.

"The present working arrangement has produced great benefits to these countries, and before any decision is made to alter it, everyone concerned should consider the wisdom of preserving it. Certainly, if it is to be altered, it cannot and should not be done on a unilateral basis—there are many interests which must be considered and protected."

separately on (1) production and sale of crude, and (2) refining, transport, and marketing. Losses in one phase will not affect amounts payable under the other, a distinction not made by the Saudis (PW—Aug.1'58,p69).

Another distinction between the two is formal recognition of competitive market conditions in Kuwait's pact, which allows for discounts off posted prices in calculating net profits from oil exports.

The Saudi agreement contains no similar specific provisions for "adjusted" posted prices. Tariki, in fact, has been insisting on a no-discount policy, which up to last week was still being resisted by prospective buyers in Japan's heavily discounted crude market.

Esso Takes Giant Step in Italy

Jersey Standard's Esso Italiana has acquired 100% ownership of Rasiom, an independent Italian refiner with a 100,000 b/d plant in Sicily—thus tripling its present Italian refining capacity.

The deal, announced last week by Jersey, follows Esso's decision last year to exercise an option to acquire an interest in Rasiom as part of its Italian refining expansion plans (PW—Nov.25'60,p34). Esso previously had a processing arrangement for 65% of Rasiom's refinery output.

Esso's plan now is to build a 4,000 b/d lube oil plant—biggest in continental Europe—at the Rasiom refinery at Augusta.

The planned capacity is double Italy's present production of solvent extracted lubricants. The new unit will go into operation in 1963. It will produce a full range of lubricants for automotive and industrial use, mostly for the Italian market, with a surplus for export to Mediterranean and Middle Eastern areas.

Esso has no immediate plans to increase crude capacity of the Rasiom refinery—Italy's largest—though the Sicilian government has authorized its expansion to 170,000 b/d, apparently under an application previously filed by Rasiom.

The Rasiom plant is Esso's first wholly owned major refinery in Italy. Esso also has an application pending for permission to build a 40,000 b/d refinery in northern Italy's Po Valley at Pavia. The proposal has passed its first government review and is currently up for a second reading.

Stanvac Cuts Bigger Pie Smaller

Standard-Vacuum—marked for split-up between its two parents—is still expanding in Japan, where it's widening its stakes, though slicing them a bit smaller.

Stanvac's Japanese interests will eventually go ⅔ to Jersey Standard and ⅓ to Socony Mobil under the agreement the two majors announced last year.

At the time, Stanvac's interests there included a 55% interest in a refining affiliate—Toa Nenryo Kogyo—with two wholly owned refineries, plus marketing organizations serving approximately 11% of the total Japanese market.

Stanvac's Japanese refining affiliate, Toa Nenryo, has expanded its interests to four plants, boosting its net capacity 25% to 124,600 b/d.

Toa Nenryo previously had refining capacity totaling 100,500 b/d at its two wholly owned plants at Shimizu and Wakayama.

Now it has stakes in two other refineries, which were put on stream late last year in the Kawasaki area by new companies in which it is a partner.

One is a 35,000 b/d plant owned by General Sekiyu K.K., in which Toa Nenryo has a 50% interest.

The other is an 11,000 b/d unit owned by Nichimo Sekiyu Seisei K.K., with Toa Nenryo holding 60%.

Toa Nenryo's two partners in these companies were originally marketers only—with their own foreign exchange allocations for oil imports.

Toa Nenryo also is set to embark on a $27-million petrochemical venture, following recent approval by the Japanese government. The project is scheduled for completion in early 1962 in the Kawasaki area.

Stanvac, meanwhile, has agreed to reduce its 55% ownership in Toa Nenryo to 50%—bringing its ratio in line with that of other foreign majors with Japanese refining affiliates.

Stanvac's agreement to give up its control of Toa Nenryo was reportedly tied in with the government's approval of its expansion into petrochemical production.

What's New

AUSTRALIA—Delhi-Taylor Oil Corp's projected 6,000-ft. test off northern Australia will be spudded next month on Mornington Island in the Gulf of Carpenteria. The test was originally planned for 1960 but was delayed by marine transport difficulties. Last year the company abandoned its second Australian wildcat, No. 1 Betoota, at 9,824 ft. in the Great Artesian Basin. It plans further surface work there this year under its agreement with the Australian-owned Santos Ltd.

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JAPAN—Foreign exchange allocations for the next six months' crude imports show prices have continued dropping in the competitive Japanese market. The total set last week for April-September is $184,671,000. It is based on an f.o.b. unit price of $1.51 per bbl., down from $1.59 in the previous six-month period, and will cover an increase of 11.2-million bbl. in crude imports.

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LIBYA—The first British Petroleum-Hunt International wildcat on Block 65 has been abandoned as dry. The test, A-1-65, the first drilled under a joint venture agreement negotiated between the two firms last year, was drilled to 7,437 ft.

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YUGOSLAVIA — Sixteen 25,000-ton tankers will be built for the Soviet Union by Yugoslavia under a new five-year trade agreement. The pact provides for increasing two-way trade 2½ times over 1960 levels, Belgrade's official news agency reported.

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INDIA—Present refining capacity could be doubled to 240,000 b/d by the end of the third Five-Year Plan in 1966—with domestic crude discoveries feeding half the expanded capacity, according to estimates of the Steel, Mines, & Fuel Ministry. The proposal includes expansion of the two state refineries under construction in the northeast. The government has announced that a third, with capacity of 20,000 b/d to 60,000 b/d, will go on stream in 1963 in Gujarat, where discoveries have been made by its Oil &

AROUND THE WORLD

Natural Gas Commission in the Cambay area.

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GUATEMALA—Signal Oil & Gas Co. has abandoned its initial Guatemalan wildcat in Peten at 3,500 ft. It was spudded in February on Signal's wholly owned 30,000-acre Canchacan structure. No information was available last week on further drilling plans.

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SPANISH SAHARA—An Italian private firm and a French government agency will join the Buckley interest of the U.S. in an exploration venture here.

Ausonia Mineraria, exploration affiliate of Edison Co. of Milan, and France's Bureau de Recherches de Petrole will share ownership of a Spanish firm set up by Magellan Petroleum Corp. and Oil Investments, which were granted Block 18 here last month.

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LIBYA—Amerada Petroleum reports it has made no commitment yet for sales of its Libyan crude, though it has been approached by a "number" of prospective purchasers—American, as well as European.

It expects to start sales of the oil in the second half of 1962, on completion of the export pipeline for production being developed by Oasis Oil Co. for Amerada, Continental, and Ohio Oil. The latter two have laid preliminary plans to move their shares to Germany and Spain respectively.

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VENEZUELA—Part of the old Barinas concessions held by Amerada Petroleum's 68%-owned Venezuelan subsidiary will be taken over by a major oil company if the government approves the assignment. Amerada says the major will drill one or more exploratory tests, with its Esperanza Petroleum Corp. retaining a small carried interest in the acreage. Esperanza last year gave up all its holdings in Eastern Venezuela.

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TUNISIA—The three-company Conorada group will "probably" start exploratory drilling before the end of 1961 on at least one prospect, according to Amerada Petroleum. The group, which also includes Continental and Ohio Oil, is meanwhile continuing seismic work on its concession, recently increased to 7.3-million acres in the southern half of the country (PW—Mar.10'61,p70).

Iran's 1960 Results: Income Up 8½%

IRAN—Record oil exports last year increased Iran's direct oil revenues 8½% to $285-million, the International Consortium's operating companies reported last week.

In addition, they brought in $68.4-million in foreign exchange for local expenditures totaling over $84-million.

The Consortium's 1960 production increased 14% to 1,048,000 b/d. Crude exports were up 16%, product exports 9%, and deliveries for use in Iran 11%.

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NETHERLANDS—Esso will build a $17-million petrochemical export plant at its 100,000 b/d Rotterdam refinery. It will be completed in mid-1963 with annual capacity of 220,000 metric tons, biggest of its kind in Europe. Products will be sold in Britain and Scandinavia, as well as the Netherlands and other Common Market countries.

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UNITED KINGDOM—A major British chemical firm will build a 20,000 b/d refinery to provide its own supplies of naphtha for its chemical operations. Previously, Imperial Chemical Industries Ltd. bought naphtha from Shell-Mex & B.P., Ltd., which has now agreed to supply crude for the refinery and to market product not needed by ICI.

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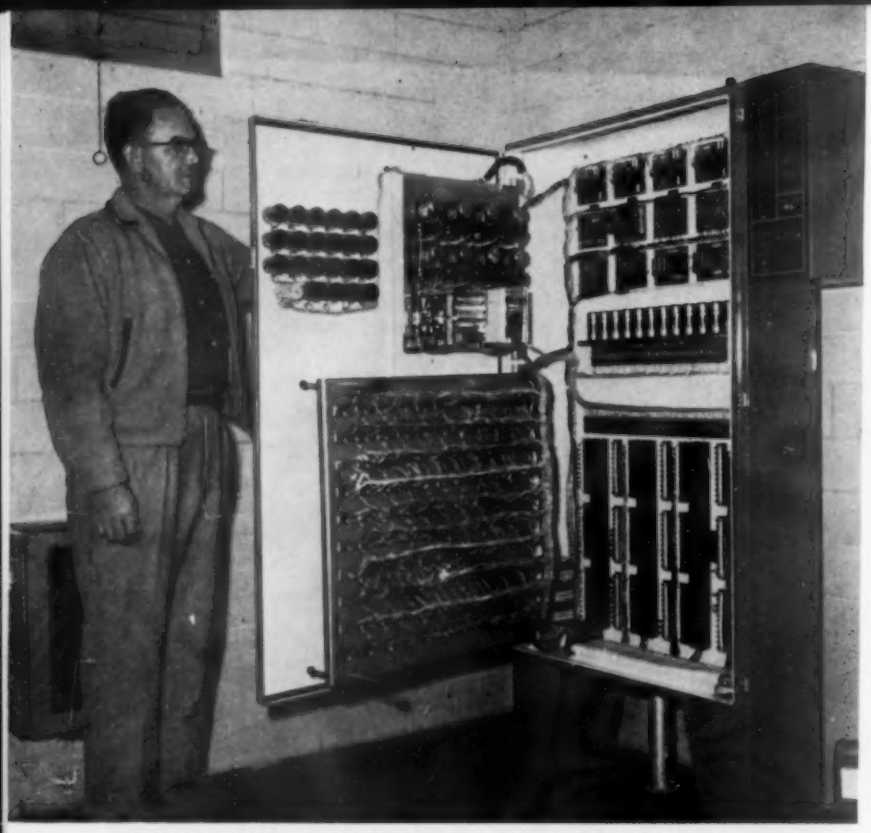
SAUDI ARABIA—Aramco will resume offshore drilling at Safaniya on arrival in June of a new drilling tender purchased to replace the Queen Mary, which sank late last year. The new deep-water tender, built in 1957, was purchased from An-Son Gulf Drilling Co., of New Orleans, for $1,350,000 and will be used with Aramco's LeTourneau platform. It is fully self-contained, unlike the Mary, with living accommodations for 50. Aramco decided on only minimum repairs for the Mary, which will be used for workovers.

Pipe On Way to Peru's Offshore Field

A cargo of 2-in. and 3-in. aluminum pipe to be used in the underwater completion of three new Richfield-Cities Service oil wells off Peru's northern coast is en route to Talara, Peru, from the Aluminum Co. of America's plant at Pittsburgh. The 240 b/d discovery well—first in the industry to be completed underwater—is now producing crude on continuous tests.

The oil is carried to a tank farm on shore, where it is sold to a Jersey Standard affiliate, International Petroleum Co., which operates a 45,000 b/d refinery in the area.



POWER-LEVEL CONTROLLER at pump station at Chelsea, Okla., is completely transistorized, as are controllers at the four other stations so equipped on the Ozark system.

STATION at Chelsea, with microwave tower to relay signals to Cushing.

TRANSDUCER monitors pressures and converts them to electrical impulses.

Ozark Stations on Autonomous Control

A new method of pipeline automation—autonomous pressure-activated control of satellite pump stations—has been proving out at five stations on the Ozark Pipe Line System.

The stations are situated at Chelsea and Grand Lake, Okla.; and at Diamond, Buffalo, and Bland, Mo. Excluding Grand Lake, the stations are among the original five on the system, the fifth being located at Cushing, Okla.

The automation concept involves the adaption of intermediate pump stations to controls based on monitored pressure signals, which are converted to electronic impulses by transducers and compared with preset master control signals.

Alternate stations are controlled by conventional remote supervision from a dispatching station.

The system is known as power-level control. It was designed and installed on the 22-in. Ozark line by Shell Pipe Line Corp. last December.

Shell Pipe Line is operator of the 433-mi. line, owned jointly by itself and Texaco Inc.

A parallel ten-in. line, owned exclusively by Shell Pipe Line, has not been equipped for power-level control. Since it has only one pump per station, true power-level selectivity isn't possible, the company explains. Instead, the pumps along this line are started and stopped by the use of flow switches.

Power-level controls "are easier and cheaper to install, simpler to maintain, and more economical to operate" than the other types of automatic controls considered by Shell Pipe Line, according to a spokesman for the company.

"Power-level control represents an economical approach to the automated movement of crude by pipeline," he says. "Perhaps its single greatest attraction lies in its simplicity, since all functions are in direct response to optimum line hydraulics."

Heart of each of the five power-level control stations is a transistorized controller, which gets signals from pressure-electronic transducers.

Three transducers—one each for station suction, case, and discharge pressures—are located on the manifold of each station. Pressures monitored and converted by the transducers are relayed to the power-level controller situated inside the station house.

Monitored pressure signals are compared by the power-level controller with incrementation and decrementation levels set manually on potentiometers, which are located on the controller's amp comparator board. Potentiometer settings are made at the beginning of each month on the basis of the power level (horsepower) requirements necessary to sustain daily flow rates, which are prorated according to the month's anticipated crude runs.

Transducers operate on a standard 110-volt circuit, but voltage is reduced by variable transformers to a range of zero to one-half volt prior to signal transmission to the power-level controller.

One-half volt of current corresponds to 1,000 psi. on the system.

A total of 15 power-level combinations, each corresponding to a different pump horsepower rating, are available within six ranges and five

groups. Each station has four pumps —one of 600 hp., one of 1,250 hp., and two each of 1,500 hp. Thus, available power levels range from a minimum of 600 hp., when only the smallest pump is in operation, to a maximum of 4,850 hp. when all pumps are in service.

A power group is defined as the sequence followed by the power-level controller when increasing or decreasing power levels.

Within each power group there are six power ranges, each succeeding the one before it by one-half unit, or 600 hp. Thus, power level No. 7 is obtained by adding one-half unit (the smallest pump) to power level No. 4; similarly, power level No. 10 is achieved by cutting out one-half unit and adding a full unit to power level No. 7.

By operating in increments of one-half unit, the power-level controller never assigns more horsepower than the minimum needed to obtain optimum (desired) throughput.

Power levels are so arranged that the controller can increase or decrease horsepower with a minimum number of starts and stops, thereby conserving power consumption and reducing equipment wear.

Pumps always operate within the same group—for any given power-level setting, as determined by the potentiometer setting on the comparator board—but with shifts in ranges to correspond to monitored pressure differentials. And to prevent total shutdown in case of a malfunction, the controller is set automatically to step down one-half unit until repairs are made.

A malfunction at a power-level station shows up both on the panels of the station itself and on the panels of the upstream and downstream remote-controlled stations.

Starting and stopping of pumps at power-level controlled stations is an exclusive function of flow rates as indicated by monitored pressures.

If, for example, flow rates should be excessive, pressure gradually builds up downstream from the power-level control station, since discharge and case pressures are continuously compared. When throttling exceeds preset limits, a signal initiates a drop to the next lower power level.

If case pressure then doesn't drop within ten minutes, the power-level controller automatically drops to the next lower power level—and, if necessary, to subsequent lower levels until the desired pressure level is again attained.

The reverse occurs when line pressure falls below required levels, thereby requiring addition of pump units.

The ten-minute time lag applies only in the event of gradual pressure buildup, which would be the case if pumps at the downstream remotely controlled station did not take all the crude being pumped by the upstream power-level control station.

On the other hand, if pressures build up rapidly, indicating some malfunction of equipment, an emergency switch overrides the ten-minute switch and acts to shut down one or more units in one minute.

Both the ten-minute and one-minute switches are adjustable to any time lapse desired and are controlled by settings on the power-level controller.

Stations not having power-level controllers are under remote supervisory control from Cushing, Okla.

They are situated at Wildhorse, Okla.; and at Lawrence, Gasconade, and Labadie, Mo.

The system's Grand Lake (Okla.) station is equipped for both kinds of control, but operates almost entirely under power-level control.

All these stations—except Grand Lake—were added in 1951-52 to handle increased throughput. Putting them on a remote-control basis marked the company's entry into automation.

Signals are beamed from Cushing to the stations via microwave as far as Chelsea, Okla., and then by company-owned metallic circuit the rest of the way. Microwave is also used for voice communication between Cushing and Tulsa division offices.

All supervisory operations are monitored and controlled from Cushing.

"Since no readings from satellite stations (power-level controlled stations) are transmitted to Cushing, dispatchers rely on interpolation of data received from remote control stations on either side," explains a spokesman. "By so doing, they are able to determine what is occurring at the power-level control stations."

What's New / IN TRANSPORTATION

Eight Companies Join To Build Dixie Pipeline

Four more companies have joined Dixie Pipeline Co., which will build a pipeline to transport LP-gas from Texas and Louisiana to the Southeast (PW—Feb.3'61,p53).

Newest participants are Humble Pipe Line Co., Shell Oil Co., Sinclair Pipe Line Co., and Cities Service Co.

The companies that originated the project are Phillips Petroleum Co., Warren Petroleum Corp., Tuloma Gas Products Co., and Union Texas Natural Gas Corp. F. B. Neptune of Phillips will be president of the new company.

Transcontinental Gas Pipe Line Corp., which has already done some preliminary work on a line that would follow roughly the same route, says it will reconsider its plans and probably decide soon whether to continue with its plans, in view of the Dixie project.

Design, engineering, and supervision of construction of Dixie's 1,100-mi. line and seven distribution terminals will be handled by Service Pipe Line Co. and Phillips Petroleum.

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The "balance of control" of Westalta Products Pipe Line, Ltd., and Foothills Pipe Lines, Ltd., will rest in Canadian hands, according to Pembina Pipe Line, Ltd., their parent company, and Standard Oil Co. (Ind.)

The two companies, which together want to build a pipeline to move Alberta LPG to Chicago, gave this assurance to the Alberta Oil & Gas Conservation Board.

Westalta and Foothills will each have nine directors, five of whom in each case will be Canadian citizens.

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Mid-America Pipe Line Co. will build a lateral from its LPG pipeline at Whiting, Iowa, to Ogden, in the central part of the state.

Robert E. Thomas, president, says most of the right-of-way has been obtained for the 106-mi. leg, which is expected to be completed this year.

Ohio Oil's Grand Strategy Advances

Ohio Oil Co.'s recent acquisition of Ross Oil Co. is more than just an expansion move. It represents the second major step in the fulfillment of the company's over-all strategy.

Through the acquisition of Ross, Ohio Oil gained 91 service stations in eastern Ohio. The stations, beginning this month, unveiled the company's "Marathon" brand signs, switching over from American Oil Co.'s Amoco brand.

Until recently, Ohio Oil had been weighted heavily in producing and transportation facilities. But it has been trying to balance these segments with a buildup of product outlets.

Although it has been a refiner since 1924, Ohio Oil's crude production has traditionally exceeded its refining capacity. In 1958, for example, the company was producing over 90,000 b/d, but was refining little more than 41,000 b/d.

As for marketing, the company has been sprinkling service stations among several midwest states for some 35 years, but it had confined itself largely to rural, low-volume markets.

By 1959, it had become apparent to the company's management that it could no longer exist profitably without expanding its marketing outlets.

The awareness of the importance of marketing came to Ohio Oil in much the same way that it came to other major oil companies. But because of Ohio Oil's marked preponderance of production capacity, the need for outlets was perhaps more striking.

In 1959, the company took its first major step in a new strategy. It acquired Aurora Gasoline Co., Detroit, and in this single move, balanced its production and refinery capacities, and started its invasion of urban markets.

Through Aurora, Ohio gained two refineries (with a combined capacity of 60,000 b/d), and nearly 700 service stations in Michigan, of which 400 are concentrated in Detroit.

Aurora had marketed under the "Speedway 79" brand, a name Ohio Oil has retained in Michigan.

In Ohio, the Ross acquisition gave Ohio Oil strong representation in Akron, where the suburban population has increased almost 65% over the last ten years.

RINGING ITS MARKETING TERRTORY with urban targets for expansion, Ohio Oil Co. is breaking out of the rural framework that has long characterized its operations.

Though the 91 Ross stations are few in comparison to Ohio Oil's overall total of 3,800 stations, they represent a boost of approximately 25% in the company's direct marketing strength in Ohio.

In this state, Ohio Oil operates only 350 outlets directly—while more than 1,000 other stations are run by dealers who purchase Marathon products.

The company is the fourth largest marketer in Ohio.

Ohio Oil is anxious to maintain the momentum generated by its expansions into Detroit and Akron.

It is looking for other urban markets, and has isolated Cleveland, Chicago, and Milwaukee for immediate attention.

In Cleveland, Ohio Oil doesn't operate a single station. But it is poised to enter the market within a few months.

In the Cleveland suburb of Brecksville, the company recently completed a 9-million-gal. terminal, to serve the entire northeast region of Ohio.

In Cleveland, however, Ohio Oil has found no large distributors that are willing to sell out. And competition for single stations is keen, with Phillips Petroleum Co. and Humble Oil & Refining Co. combing the market for outlets.

As for building its own stations, Ohio Oil plans no crash program. The price of land and buildings in Cleveland would not allow the company to make such a move.

Further, the company explains, it does not want to dilute the market with a full-scale building program.

In Chicago, the company has

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Fire Prevention

Electronic Surveillance

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started its expansion campaign, but thus far it has largely concentrated on the suburban periphery.

At present, Ohio has opened only 23 stations in this area. But its well-placed transportation and supply network may well serve as the trump card that will make its hand look good after all.

The company operates a newly opened terminal at Des Plaines, Ill., near Chicago's O'Hare airport. This terminal will receive product by pipeline from the company's main refinery down-state in Robinson, Ill.

In nearby Wisconsin, Ohio Oil maintains only one jobber, and in urban Milwaukee, the company is without a single outlet.

But expansion plans here will be geared to the company's two Wisconsin terminals in Two Rivers and Milwaukee.

Despite Ohio Oil's designs in these markets, its success as a marketer will depend largely on the example it sets in its home state.

Ohio presents perhaps the industry's most challenging marketing problem. "Somewhere in this state," says Grant H. Young, marketing vice-president for the company, "is where East meets West. That is, where the imported crude coming through the East Coast meets the domestic crude coming through Ohio Oil's pipelines from the West."

With the intermingling of sources of supply has come a clash of major oil companies. Besides the competition between such new entrants as Phillips and Humble, there are the expansion moves of Pure Oil Co., Atlantic Refining Co., and Sun Oil Co. and other majors to consider.

This competition operates under the traditional market dominance of Standard Oil Co. (Ohio), which holds 30% of the state market.

A third tier of competition is created by the upsurge of private brand marketers. Bonded Oil Co. and Tresler Oil Co., for example, have consistently shown spunk in draining Ohio gallonage from the majors.

Many private branders in the state draw product from the majors themselves, thus tending to recreate the dual marketing problem that wrought price havoc in California a few weeks ago (PW—Mar.17'61,p44).

Ohio Oil markets about 20% of its product through private branders.

The company's acquisition of Ross Oil must be considered something of a coup.

And the fact that not a single Ross dealer was lured by the overtures of competitors—and there were efforts in this direction—must be credited to Ohio Oil's attraction.

Chief among the company's appeals is its size. It is large enough to offer major company status, but small enough to promise individual attention to distributors who join its ranks. This naturally appeals to jobbers.

"We liked the way Ohio Oil approached us," Ray Ross, Jr., president of Ross Oil, confides. "Ohio Oil is the one company I know of that does more than it says it's going to do."

Ohio Oil will be trying to make a similar impresson on jobbers and dealers in other parts of Ohio. Besides its expansion plans in the Northeast, the company is looking to the Southwest as well, particularly to Cincinnati, for additional outlets.

One factor that will no doubt give the company added attraction in these expansion campaigns is its comparative growth.

Last year, for example, Ohio Oil increased its total gasoline sales by 9%, when the industry was moving ahead by less than 2%.

What's New / IN MARKETING

Radical 'Gas' Pump Gains

A third manufacturer has introduced a service station pump that separates the three functions of pumping gasoline, metering its flow, and visually displaying the amount dispensed.

The new entrant in the field is Symington Wayne Corp., which thus follows Bowser, Inc., and DeHavilland Engine Co., England.

Bowser has not yet got beyond the testing stage, but DeHavilland is installing its units in the stations of British Petroleum Co. in Italy and England (PW—Jan.27'61,p39).

It is in England, too, that Symington Wayne will introduce its units. Its subsidiary there, Wayne Tank & Pump Co., Ltd., worked with Shell International Petroleum Co., Ltd., to develop the new pumps.

Just as in previous innovations, these pumps electrically transmit metering information to remotely located computer dials. A single dispensing control enables a dealer to choose between two products from each pump.

Symington Wayne intends to unveil its "telereading system" to domestic companies at its engineering conference at Salisbury, Md., in May.

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The California legislature has moved to clear up some of the confusion surrounding the issuance of trading stamps at service stations in the state.

The problem stems from a ruling, set forth last spring, by state attorney general Arnold Mosk, that requires dealers to post stamp values on their price signs (PW—Jun24'60,p88).

Now the California assembly has written provisions that would more or less cancel Mosk's ruling.

A bill, passed by a vote of 45 to 22, indicates that there is no intention to require dealers to post a cash or merchandise value of trading stamps on price signs. It is given a good chance to pass in the state senate.

•

Sun Oil Co. is trying to expand its penetration into the heart of the Chicago market.

It is advertising for dealers—"no experience necessary"—and offering them a paid, six-week training course.

Sun, which entered the Chicago metropolitain area five years ago, now claims 150 stations there. It is just now, however, entering the city proper.

•

Tidewater Oil Co.—for the first time in its history—has completely unified its lubricant packaging.

The new look runs through the entire 48-year-old Veedol line from 55-gal. drums to 1-quart oil cans.

Tidewater has varied its use of color schemes, however, to draw attention to its premium grades. Irridescent blue and gold for its top-grade motor oil, for example, outshine the light green of its economy grade.

•

Motorists who want to see a major-league baseball game in Philadelphia will find Atlantic Refining Co. willing to lend them the money for tickets.

By flashing an Atlantic credit card, a motorist can reserve seats in advance. Atlantic simply adds the price to his monthly bill.

The Market Trend

PETROLEUM WEEK

April 14, 1961

Tanker Glut: New Orders Are at a Low Ebb

The low state of the tanker market shows up in the scarcity of new-building orders in the first quarter of this year. This is a far cry from the booming days of the mid-fifties. It's hard to believe that not so long ago owners were paying up to $500,000 just to reserve a berth space.

Only four nations got any real orders for tankers so far this year. According to a compilation by Seabrokers, Inc., of New York, Japan, Norway, Sweden, and the U. S. got most of the new business.

The revaluation of the German mark and the Dutch guilder caused some hesitation among owners with vessels on order in these countries. No contract changes are reported, Seabrokers says, but it is expected that building prices will be increased by about 5% in the affected yards.

Biggest single order was placed by Idemitsu Kosan in Japan. The company ordered two 130,000-ton turbine tankers, the largest of their kind afloat. (In New York last month, Sazo Idemitsu told Petroleum Week that he now holds about 16% of the oil business in Japan, and jokingly added he'd like to get all of it.)

New orders right now seem to line up mostly below 50,000 tons. Caltex recently signed a seven-year charter on a 40,500-ton tanker to be built in Norway, delivery 1963. Texaco placed an order in the U.S. for five 25,300-ton turbine tankers to be built at Bethlehem's yard at Sparrows Point.

On the other hand, some of the big babies are being increased in size during construction. According to Seabrokers, Esso has altered a building contract in Holland to increase the size of one vessel from 77,000 to 84,500 tons. Esso also has two ships building in Germany, which will be increased in size by the same amount. An oil/ore vessel building for San Juan Carriers of Monrovia has been increased from 65,500 to 67,500 tons.

T2 conversions still go on, mostly using foreign midbodies. Chemical Carriers bought two such T2s for conversion, and Texaco placed a jumbo contract in the U.K.

One LP-gas tanker was ordered in Japan. Conch International has on order a ship to carry 28,600 cubic meters of propane at a temperature of minus 400F.

Majors Look to Retailers:

Watch for more buy-ups of distillate retailers. It's a trend. Major marketers will lean toward retailers, rather than try to build up sales through tanker terminal customers.

The going price for peddler take-overs seems to be about 5¢ a gal. on the seller's volume. Sometimes this is paid off in six annual installments, just to make sure that the seller doesn't have a lot of "friendship" sales he takes with him.

The Market Place

AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All prices as of April 10

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem 11.75-13.25
- Gasoline, 92 oct reg 10.75-11.5
- **Kerosine ..... 9.625↓-10.75**
- **Heating oil, No. 2 ..... 9↓-10**
- **Gas oil, 48-52, d.i. ..... 9.25↓-9.75**
- Fuel oil, bunker "C" $2.20-2.40

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 14.75
- Gasoline, 93 oct research prem 10.875
- Gasoline, 87 oct research reg 9.5
- Gasoline, 80 oct research 8.75
- Gasoline, 70-72 oct motor method 8.625
- Kerosine 9.875
- Heating oil, No. 2 ..... 8.625
- Gas oil, 48-52 d.i. 8.875
- Fuel oil, bunker "C" $2.00

New York Harbor, barges
- Kerosine 10.95-11.4
- Heating oil, No. 2 ..... 9.95-10.4
- Fuel oil, No. 6 ..... $2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg 12.5-13.25
- **Kerosine ..... 10.375↓-10.625↓**
- Heating oil, No. 2 ..... 9-9.25
- Fuel oil, No. 6 ..... $1.65-1.90

Chicago, bulk
- Gasoline, 92 oct reg 11.5-12
- **Heating oil, No. 2 ..... 9.5-11.35↓**
- **Fuel oil, No. 6 high sulfur ..... 7.4↓-7.65**

Los Angeles, rack
- Gasoline, 88 oct reg 10.8-12.65
- Diesel fuel, PS 200 ..... 7.75-11.25
- Light fuel, PS 300 ..... $2.90
- Heavy fuel, PS 400 ..... $2.10-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3 ..... 4.5
- FOB Breckenridge, Tex. 4

LP-Gas
- **Propane, Oklahoma (Group 3) ..... 3.5↓-4***
- Propane, Baton Rouge 4.625

Pennsylvania Lubes
- Bright stock, 25 p.t. 26
- 200 vis. neutral, 25 p.t. 28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. 26-27
- Neutral solvent, 200-210 vis. 23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 26-27
- Neutral, solvent, 200 vis. 23-24

**Effective Apr. 6.*

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- **Avgas, grade 100/130 ..... 15.75†**
- Gasoline, 79 oct research 9
- Kerosine 9.75
- Gas oil, 48 d.i. minimum 9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9 ..... $2.69-2.97
- North Dakota, 36.0-36.9 ..... 2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ..... 2.92-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.00
  - West Texas, N.M., inter., 36.0-36.9 ..... 2.93
  - West Texas, N.M., sour, 32.0-32.9 ..... 2.71-2.85
  - East Texas, flat 3.05-3.25
  - Mirando, 28.0-28.9 ..... 2.96-3.31
- Illinois Basin, flat 3.00
- Pennsylvania Grade, Bradford dist., flat 4.80
- California, Signal Hill, 21.0-21.9 ..... 2.33†
- North Louisiana-Arkansas, 36.0-36.9 ..... 2.72-3.02
- Wyoming, sweet, 36.0-36.9 ..... 2.85-2.90
- Wyoming, sour, 32.0-32.9 ..... 2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.) $2.38
- Leduc-Woodbend (Alta.) 2.53
- Redwater (Alta.) 2.42
- Steelman A (Sask.) 2.425
- Virden (Man.) 2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz $3.10
- Oficina, 35.0-35.9, Puerto la Cruz 2.80
- Tia Juana, Medium, 26.0-26.9, Amuay 2.30
- Bachaquero, flat, La Salina 1.85
- Lagomar, 31.0-31.9, Cardon 2.55
- Lagunillas Heavy, flat, La Salina 2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura $1.80
- Safaniya, 27.0-27.9, Ras Tanura 1.47
- Iran, 34.0-34.9, Bandar Mashur 1.78
- Iran, 34.0-34.9, Abadan 1.73
- Iraq, 35.0-35.9, Fao 1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.59
- Qatar, 41.0-41.9, Umm Said 1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud 1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud 1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud 1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon $2.17
- Iraq, 36.0-36.9, Tripoli, Banias 2.21

North Africa, Bougie, Algeria
- Hassi Messaoud, 40 and above $2.65

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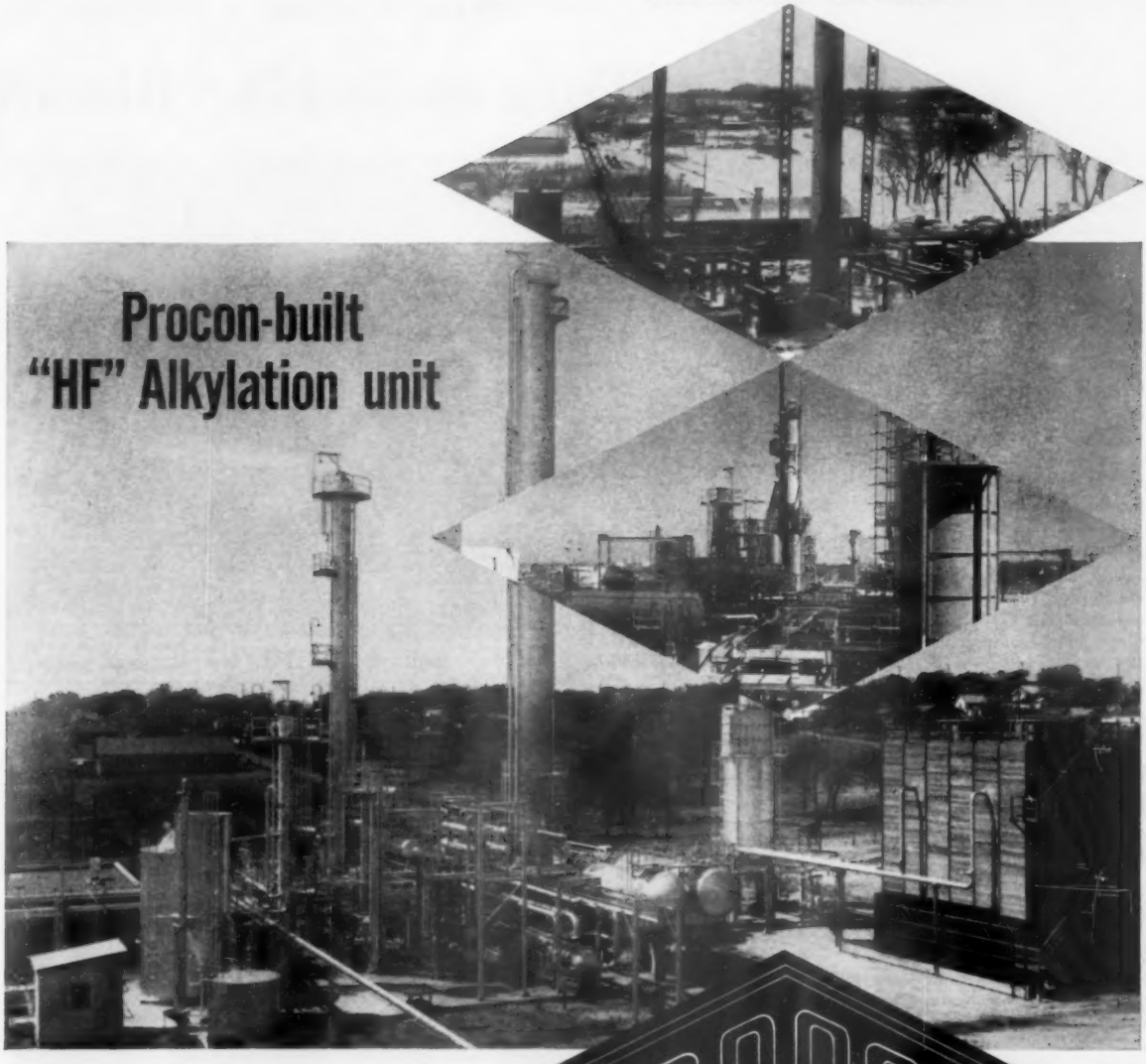
(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean	(ATRS—27½%)	$2.07
U.S. Gulf-New York, dirty	**(ATRS—30%)**	**$2.00↓**
NWI-USNH, dirty	(ATRS—60%)	$1.10
NWI-UK/Cont., dirty	(Scale—62½%)	12/3*
Persian Gulf-UK/Cont., dirty	(Scale—52½%)	29/6*
Persian Gulf-USNH, dirty	(USMC—65%)	$4.45

**Sterling*



Procon-built "HF" Alkylation unit

... on-stream ahead of schedule

Maintaining schedule during the construction of a processing unit requires the precise co-ordination and timing of a series of design, engineering, procurement and construction details. But to complete ahead of schedule requires the extras in experience . . . in judgement, that save minutes and days. A right decision . . . a proper procedure . . . a new technique, these are the *experience factors* that help PROCON build better and on time.

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Refiners Turn to In-Line Blending

Substantial savings can be achieved in refineries by improving the handling, blending, and shipping of stocks all the way from crude oil to finished products.

The transfer of products from tanks to processing units, the blending of various streams, and the shipping of finished products are done for the most part today the same way as they were 30 years ago. Multiple pump-over of components, batch processing of additives, followed by hold time in tanks for adequate mixing, and more wasted time for sampling and testing, are the rule. And often, final blends must be reworked because they are off specifications.

In the next few years, more efficient techniques, which will conserve space and time, give more operating flexibility, increase tank utilization, and offer greater accuracy in the preparation of finished products, should play a big part in refinery cost reduction.

The installation of an in-line blending system is one way of starting such improvements. That's why in-line blending is becoming more and more popular.

At this week's meeting of the Western Petroleum Refiners' Assn., in San Antonio, Tex., in-line blending was one of the main subjects under discussion. One of the speakers, B. G. Crane, manager of operations of the petroleum chemicals division of E. I. du Pont de Nemours & Co., reviewed recent developments in in-line blending techniques.

In-line blending, in contrast to batch blending, is a continuous method for preparing finished products by mixing together carefully proportioned quantities of various refinery streams.

Refiners today may have to blend into their gasoline ten or more components originating from different sources, plus an increasing array of additives, dyes, and inhibitors. Jet fuels, heating oils, and other distillates are also generally blends of several components.

As a result, during the past few years there has been an increasing interest in in-line blending.

At present there are three basic types of in-line blending systems from which to choose. They are:

(1) The mechanical reference system, which uses electrical transmission of demand signals to a remote meter station, a mechanical comparator, and mechanical or pneumatic controls.

(2) The electronic analog-to-digital system, with digital transmission of the demand signals, a mechanical comparator, and pneumatic controls.

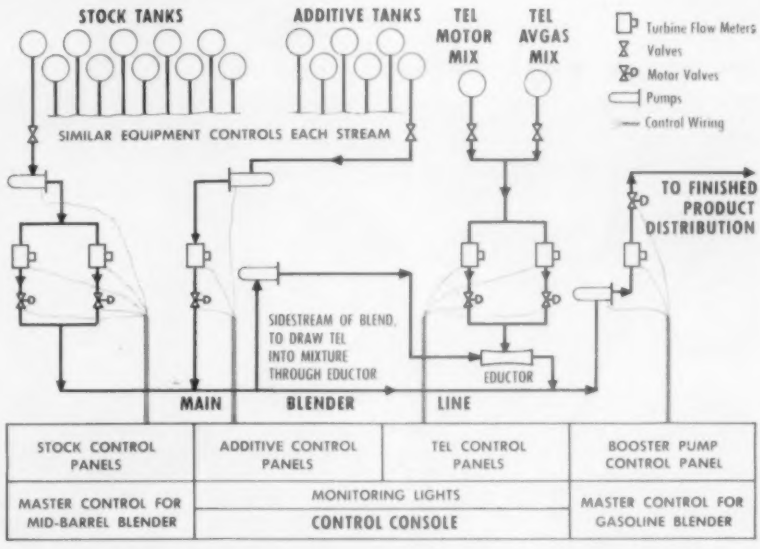
(3) The electronic all-digital system, using digital transmission of signals, digital comparator, a digital-to-analog converter, and analog controls.

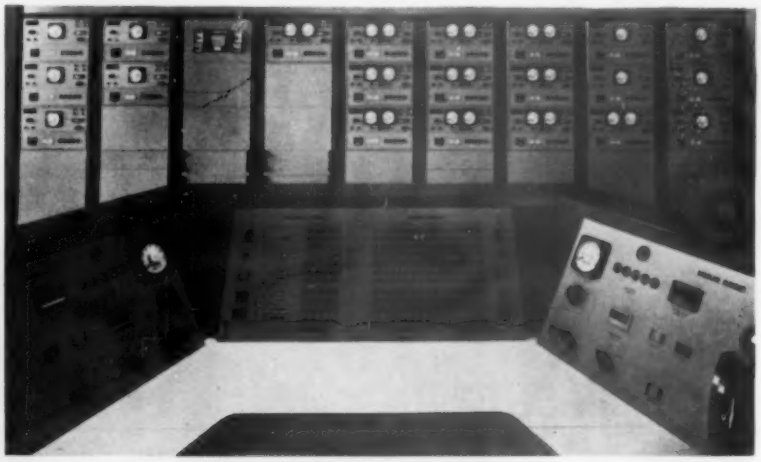
The Oleum (Calif.) refinery of Union Oil Co. of California installed one of the first in-line blending systems in 1955. It used mechanical transmission throughout.

The Delaware City refinery of Tidewater Oil Co., on the other hand, uses pneumatic transmission to operate the various control valves.

The first electronic gasoline in-line blender was installed last year at the Santa Fe Springs (Calif.) refinery of Wilshire Oil Co.

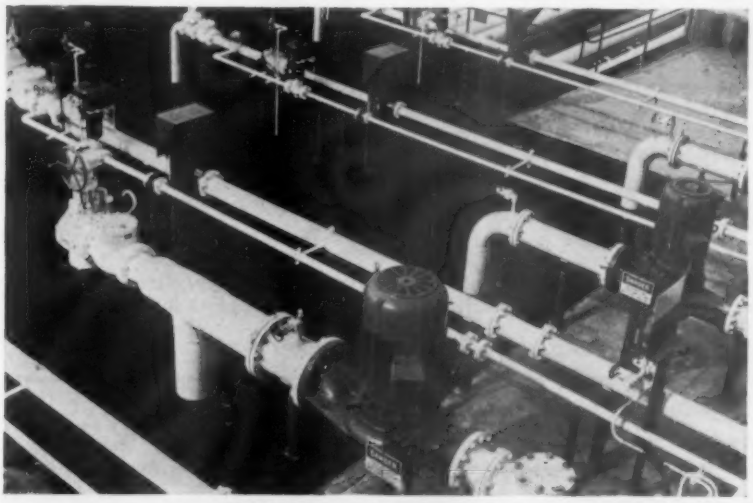
Both the mechanical blender at Oleum and the electronic blender at Santa Fe Springs were built by Pro-



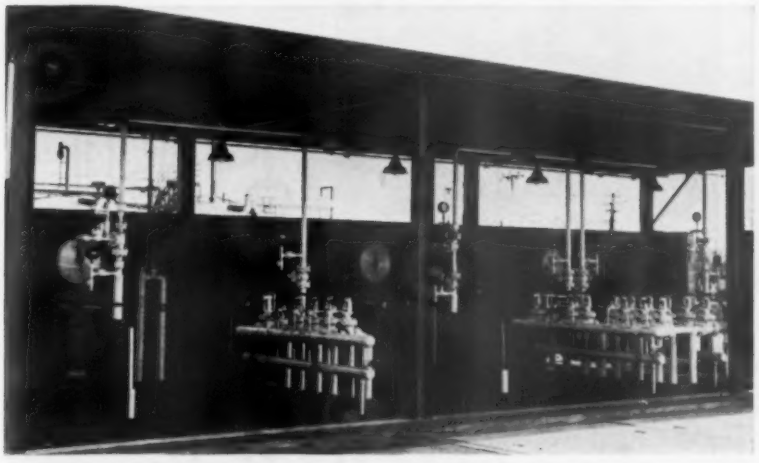


ELECTRONIC CONTROL of in-line blending operates on the principle of a continuous comparison of the flow of each stock with signals from a master demand oscillator. These signals are set initially when the blending program is prepared.

for Better Products at Less Cost



TURBINE METERS AND MOTOR CONTROLLED VALVES on each stock stream are installed in two parallel runs, one for high-range and one for low-range metering.



VERTICAL EDUCTORS are used to empty additive concentrates from the drums, in which they are delivered to the plant, into the additive mixing tanks. From the tanks, they will be fed into the main stream of blended stocks.

portioneers Division of B.I.F. Industries, Inc.

The advantages of in-line blending over batch blending are many, the WPRA meeting was told. Among those cited:

• Increased tank utilization. For example, in a 125,000-bbl. tank, Crane explained, the filling time and the complete cycle time can be reduced from 36 hours to 24 hours, and from 58 hours to 38 hours, respectively, when changing from batch system to in-line blending.

At the Toledo refinery of Standard Oil Co. (Ohio), where in-line blending was installed in 1958 as part of an expansion program, a saving of $585,000 was realized in tankage alone, Crane said, even though the blender was installed in an existing tank field. And Wilshire, he reported, found that four new tanks with in-line blending facilities gave capacity equal to that of eight new tanks that would have been needed with batch blending, and the total cost was the same.

Pumps and lines, likewise, are better utilized with in-line blending, because of the one-direction, straight-through flows.

• Blending closer to desired specifications, and conservation of valuable components. "Even ¼ of 1% saving of such components on an annual basis can add up to a sizable dollar saving," Crane told the WPRA meeting.

• Better quality control and elimination of reblending. The control is better, Crane said, but by no means easier, as the samples must be truly representative. Tidewater, he reported, feels that "the entire success of the blending operation depends on proper mixing, sampling, and laboratory-testing of the component stocks."

• Faster, more flexible blending. "Wilshire," Crane said, "formerly required 48 hours to make a 20,000-bbl. blend by the batch method. With their new in-line blender, this is now accomplished in one 8-hour shift."

• Decreased manpower.

• Increased safety, mostly because of the safer, all-enclosed handling of butane—blended in absorbed state—and of TEL—which is conveyed to the blending point at the desired finished concentration.

In-line blending has become the rule for new refineries. And the latest technical developments in electronics now make it possible to justify the installation of in-line blending in existing installations as well.

Among these developments, Crane indicated:

• Improved, dependable, solid-state electronic components—such as transistors and diodes—at lower cost.

• Control systems using computer-type circuits.

• Transmission of signals in the form of digital pulses.

• Shielded cables that permit the transmission of low-level signals (measured in millivolts) over long distances without interference.

• Constant-concentration TEL loops, to eliminate the necessity of building or moving new TEL blending facilities.

The constant-concentration TEL loop was developed by Du Pont in cooperation with B.I.F. Industries. In this system, the amount of gasoline pushed through the line is increased or decreased to give the desired TEL

dosage in the blend header. The TEL concentration in the gasoline return line is always kept the same.

Du Pont's first constant-concentration loop is planned for a refinery where the TEL facilities are located 2,100 ft. away from the blending point; a 4-in. existing line is used for the loop. Du Pont claims that about $50,000 in installation cost will be saved.

Latest in-line blending installation is the electronic all-digital system at the Wilmington (Calif.) refinery of Union Oil Co. of California (pictures, pages 48-49). There are two blenders, one for gasolines and jet fuel, and the other for mid-barrel distillates.

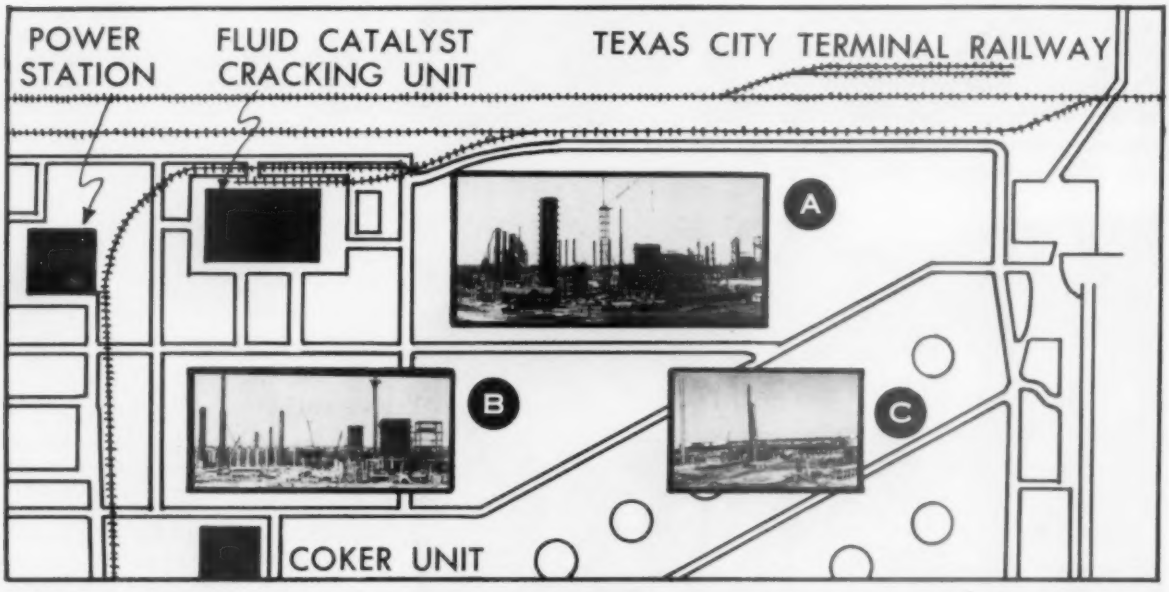
Union's A. F. Stribley, Jr., described at the WPRA meeting the work that led to the selection of this type of system, the preliminary tests of various pieces of equipment, and the results of the installation after three months of operation.

The blenders, he said, went on stream on Jan. 17, 1961, and have exceeded expectations. To date, several million barrels of various products have been prepared with the blenders, and the production has been on grade in all cases. Operating difficulties have been minor, Stribley said: a few screen pluggings, some clearance adjustments, and a few electronic module card failures.

This installation includes certain novel features, selected after nearly a year of careful experiments. The most significant is the use of turbine meters.

The location of the tank area and of the area selected for blending precluded a mechanically controlled installation, such as Union Oil had at Oleum. An all-solid-state electronic transmission and control system was selected. Turbine meters were selected in preference to displacement meters, Stribley said, after eight months of tests, during which over 4-million bbl. of products were handled.

Fluor Corp., Ltd., engineered and constructed the blenders; Waugh Engineering Co. supplied the turbine meters and the amplifiers; and Packard Bell Computer Corp. made the bulk of the electronic components and packaged the control system.



HUGE PIPE STILL (A), CAT CRACKER (B), AND ALKYLATION UNIT (C) begin to take shape at Texas City, as . . .

American Oil Co. Expands Its Refinery

American Oil Co.'s modernization program at Texas City is moving along in high gear. The program is now more than 25% complete.

The three units under construction are a pipe still, a catalytic cracking unit, and an alkylation unit.

The crude still and the alkylation unit will have the distinction of being among the world's largest (PW—Apr. 22'60,p64).

Refinery throughput will be affected very little by this new construction.

The program will make the plant more efficient rather than increase its capacity; the increase in throughput will amount to no more than 10,000 b/d, and will be the result of better utilization of the equipment, according to American Oil.

The company anticipates a reduction in operating expenses upon completion of the program.

The modernization will enable the company to shut down five oil units and a power station. Three of these units are carbonation units, that is, combinations of distillation and thermal cracking units; one is a gas polymerization unit, and one a treating unit.

Also, the new units now under construction will have longer continuous runs between turnarounds. Each of the three units should be able to operate for two years or longer without a turnaround, according to company estimates.

A substantial saving will be brought about by the integration of the three new units.

This means, the company explains, that intermediate tankage within the plant will be minimized, and that heat will be utilized more efficiently.

Also, the processing scheme makes a higher percentage of more valuable

SPECIAL

REFINING

REPORT

How serious is over-capacity in the oil business? How high are the high refinery runs that everyone is talking about? What's being done to correct the situation? These are the questions to which oilmen in general and refinery men in particular are anxiously looking for accurate, reliable answers. Petroleum Week is conducting a survey to get the answers to these and many more questions that are of interest to oilmen everywhere. The results of this survey will be printed in Petroleum Week's special report on refining, scheduled to appear in the May 5th issue. Here, in a single report, you'll find the facts on total throughput, average throughput, and the number of refinery on-stream days in 1960. You'll learn how this compares with 1958—unit for unit. There'll be percentage figures on how 1960 petroleum production was divided up; how much for regular motor fuels, for high test motor fuels, for jet fuels, for petrochemical conversion, etc.

This Petroleum Week special report will present the facts in an area where there has been much talk and little evidence. It will be an important issue for the readers of Petroleum Week. If you sell to the oil industry, Petroleum Week's readers are your customers. Put your sales story before them in this very special Special Report issue. (Copies of this issue will be distributed to registrants at the May API Refining Division meeting in Houston.)

REFINERY SPECIAL REPORT ISSUE: MAY 5TH
ADVERTISING CLOSING DATE: APRIL 14TH

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products, and cuts down the heavy-ends production.

The crude still, "where everything starts," is expected to be completed this fall.

Upon completion, it will have a nominal capacity of 150,000 b/d.

The still is being constructed by M. W. Kellogg Co. It is preceded by two electric desalters.

The crude still contains its own treating facilities for butane, kerosine, and gasoline, sour-water stripping, and caustic rejuvenation, to handle spent caustic from the butane purifiers.

Gas oil from the crude still is fed at high temperature directly into the catalytic cracking unit.

This unit, a Kellogg Orthoflow B-Type, has a fresh feed capacity of 47,500 b/d. A like amount can be recycled.

American Oil is installing two CO boilers to provide the necessary steam for the cat cracker. Enough steam will be provided by the CO waste heat boilers to close down one power station in the refinery.

Two gas turbines, each of 14,000 hp., will be installed on the air blower and the gas compressor.

The exhaust from the gas turbines will go to the waste heat boilers.

Steam turbines will be installed as stand-by. They are of the extraction type, and can adjust themselves to the steam balance in the plant.

Some unusual provisions were made in the design of the cat cracker, because of its very large recycle capacity.

There will be two separate risers, one for fresh feed and one for recycle feed. "By varying the recycle rates and the temperature, we can get a wide range of flexibility," explains a spokesman for the company.

Butane, gasoline, and light cycle gasoil will be treated right in the cat cracker unit. And sulfur will be removed from the propane stream.

Air coolers will be used in the crude still and the cat cracker.

In the pipe still there are almost 1-million sq. ft. of air cooling surface, and some 500,000 sq. ft. will be used in the cat cracking unit. By using air coolers there, instead of water coolers, there is a saving in operating and maintenance costs, as well as in capital investment.

The alkylation unit will not use air coolers.

The company says that heat levels are so low in this unit that air coolers would be uneconomical.

This unit has an output of 14,600 b/d. It is of the sulfuric acid type, with eight Stratford contactors. It is being constructed by Fluor Corp., Ltd.

It has a 10,000-hp. refrigeration compressor with steam turbine drive. There is also a 7,000 b/d isomerization section in the alkylation unit to make isobutane, because more isobutane will be needed for alkylation than is presently available.

The control facilities and electronic equipment could lead to eventual computer control over the three units under construction.

The company reports that the electronic equipment would not require a great amount of work if computer control were adopted.

The modernization program includes the installation of automatic feedstock pumping, and remote tank gauging.

The operators of the units will be able to pick the feedstock they desire by remote control of pumps located near the storage tanks. This eliminates double handling of these stocks and, the company says, results in lower inventories and more uniform blends.

Remote gauging facilities will be installed on approximately 190 crude and products tanks at Texas City.

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New Tricks in Adhesive Bonding

A new concept of adhesive bonding, called "composite adhesive," may greatly increase the use of adhesives to replace conventional methods in the assembly of structural materials.

Manufacturers of adhesives see a great future for their structural use—not only in military and commercial aircraft, where they are quite extensively used at present, but also in such structures as buildings, automobiles, and ships.

However, the distribution of the "shear stress" within a joint that is bonded with an adhesive has puzzled the industry for many years, and has imposed limitations on the application of the adhesive bonding technique.

At the recent National Automobile Week meeting of the Society of Automotive Engineers, in Detroit, Sam Dastin and Philip Rosenberg, of Republic Aviation Corp., Farmingdale, L.I., N.Y., presented the results of an extensive study of adhesive bonding. Republic has been investigating the suitability of this type of bonding for high-strength steel rocket-motor cases.

The new concept is derived from the fact that the stress imposed upon an adhesive varies within the joint.

Early tests by Republic and others have shown the importance of high-shear bonding agents of great flexibility. But this is not sufficient: The shear stress distribution within the joint is the factor that controls the strength of the bonding, Republic found. And its effects, the two spokesmen said, have up to now been practically ignored by the adhesive industry.

These tests led to an extensive mathematical study of the incremental stresses and strains within adhesives used for structural bonding, Republic explained, and the design of typical diagrams showing the distribution of stresses in different types of joints with different adhesives.

In order to increase the load-carrying capability of a joint bonded with adhesives, it is essential to use a combination of several adhesives in such a way that their properties vary within the joint according to their location, Republic says.

A composite adhesive would be one with a maximum shear modulus near the center, and a decreasing shear modulus—with an increasing flexibility—toward the edges of the joint.

In the rocket-case assembly, for example, a phenolic epoxy should be used in the center of the 6-in. lap joint, Republic told PETROLEUM WEEK; a phenolic vinyl adhesive would be more satisfactory for the intermediate parts; and a phenolic-elastomer combination such as AF-30, made by Minnesota Mining & Mfg. Co., is required on the edges, for high flexibility.

These adhesives are usually supplied as dry films, sometimes impregnated on a fiberglass cloth carrier, protected by a sheet of polyethylene. They are inactive until heat and pressure are applied, to cause flow and chemical curing to a nonfusible, nonsoluble, inert solid.

When thoroughly developed, the composite adhesive will give designers a tool with which to create hardware previously considered to be unattainable, according to Republic.

Compound structures of different metals, joined with adhesives, will provide structures with great versatility, with a significant weight reduction over conventionally assembled structures, and at lower cost, Dastin and Rosenberg said. Design changes can be made quickly, without the need for costly and complicated tooling, they added.

"Two-step technique" is another way of improving the application of adhesives to structural bonding, in an effort to obtain uniformly high-quality bonds at reasonable cost.

This technique was described at the SAE meeting by E. J. Sydor, of the Cycleweld Chemical Products division of Chrysler Corp. It is intended principally for application to bonds with nitrile phenolic adhesives, where both temperature and pressure are required for proper adhesion and curing.

It consists in preheating the parts to be bonded to an optimum temperature, then applying pressure for a short time only—long enough for the adhesive to gel—outside of the oven.

This first step is then followed by curing at the proper temperature—but without applying pressure.

"As the heated press is the most expensive piece of equipment, and a major obstacle to greater acceptance of nitrile phenolic adhesives for high volume production," Sydor explained. "This two-step bonding offers a way to reduce capital costs substantially."

Although phenolic resins have been used fairly successfully in joining metals, they have their disadvantages, Sydor pointed out.

For one thing, they have "a small but significant volume reduction dur-

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MANAGEMENT STATUS: DREAM OR MIRAGE? TECHNOLOGY AN ASSET, OTHER TRAINING NEEDED

The complexity of modern industry has created a great demand for management personnel with engineering training. Surprisingly, there is a very short supply of such men, i.e., engineers with enough potential to be groomed for executive functions.

Historically, as big industry moved out of restricted, private ownership into broader public ownership, two things happened, both of which added to the demand for "management men." First, public ownership made possible more diversified management, as opposed to the centralized control characteristic of family ownership. Second, the complications and diversification of modern industry have sharply increased the ratio of executives to employees. Where the ratio was formerly approximately one executive to 100 employees, it is now more like one to 35.

Recognizing that employment has increased by about one-third during the same period, the need for management personnel becomes clearer. Not only do few engineers graduate from school ready to be managers, few of us study courses as undergraduates which would prepare us for executive leadership later in our careers. Finally, as a prerequisite for managing the affairs of others, there is no substitute for experience.

WHAT DO YOU REALLY WANT?

If you are facing this important decision in your present status, get your future into focus before taking the step. Decide what you really want from your personal and business careers. It is sometimes too easily assumed that all men want to move on to higher, executive positions. With few exceptions, all men pay lip service to "wanting to get ahead," but too many of us hoodwink ourselves into believing this means management responsibilities, without fully recognizing the significance of such a step.

As a matter of fact, all men *don't* want to advance into management. Some, however, find this out too late, for unless they are psychologically and emotionally suited for the rigors of management, the driving ambition to assume more leadership, responsibility and authority may not in itself be a worthwhile goal. If a man is doing well where he is, it may be a mistake for him to try to move into the management orbit, for the move to management is not the only door to advancement.

FOOTNOTE: These are only the first few paragraphs of Western's latest "professional advancement" series. Booklet E-9. Titled "Engineering-Management Status: Dream or Mirage?" your copy is free upon request. Write to Western Supply Company, Heat Exchanger Division, P. O. Box 1888, Tulsa, Okla. — **where your advancement is to our benefit and where the right decisions produce quality-design heat exchangers.**

ing the thermosetting reaction, and unless consideration is made in the design, high stresses can be set up in the bond, which can result in lower-than-expected strengths. Further, cured phenolic resins are quite brittle, and sharp impact loading can result in bond failure.

The development of new resins, such as cyanoacrylates and modified epoxies, may soon bring about dramatic advances in the adhesive bonding of structures, Sydor said.

Cyanoacrylate resins, he reported, can be catalyzed by water (among other simple agents). When very thin films of these resins are exposed to air, enough moisture is absorbed to start the curing reaction within a minute, and fingertip contact for a few minutes will form a bond with high shear strength. The strength of the bond increases threefold after aging 24 hours.

Modified epoxy resins containing latent catalysts are receiving much attention, Sydor said. They need heat to initiate the curing reaction, but have many advantages: No mixing is necessary; they have a long pot life; and their strength is high.

Objections to both cyanoacrylates and modified epoxies: low impact strength, and significant loss of strength above 200F.

What's New / IN PROCESSING

Northern Natural Gas Co. and Houdry Process Corp. have set up a joint program to develop a fuel cell using natural gas.

The most critical part of the program will be to find the right catalyst to combine with air and gas in the cell, the companies say. Research will be conducted at Houdry's Linwood (Pa.) laboratories, where fundamental fuel cell research has been in progress for some time.

The joint program is aimed at developing a cell that will supply electricity to meet all energy requirements of a household or business at a cost significantly less than that of current sources.

•

A gasoline additive already used by refiners and marketers to protect processing and transportation equipment from corrosion also prevents fouling of automotive carburetor throats, Universal Oil Products Co. reports.

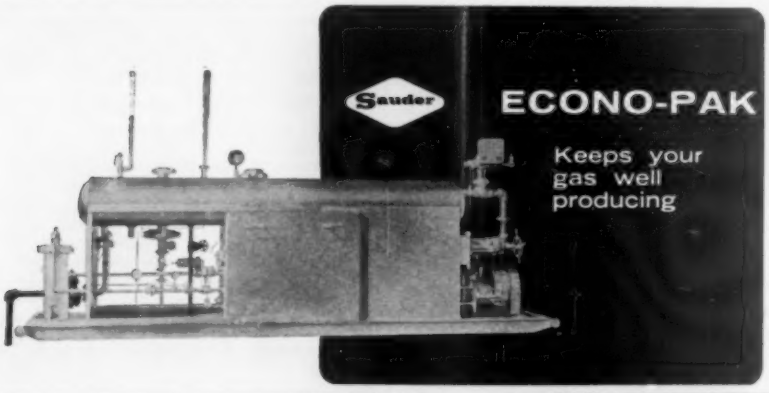
Tests show that the additive, Unicor LHS, added to gasoline during the processing stage, removes carburetor deposits in automobile engines better than products formulated for that purpose, the company says.

•

Hydrocarbon Research, Inc., is building a $15-million refinery in Argentina that includes a unit using its HDA process for producing benzene, and facilities for manufacturing high-octane gasoline. The HDA process was developed jointly by HRI and Atlantic Refining Co. (PW—Mar.3 '61,p43).

The refinery is being built for Yacimientos Petroliferos Fiscales, the Argentine government's petroleum enterprise. In addition to the HDA unit, it will include an aromatics extraction unit and a catalytic reformer.

Initial capacity will be 8,000 to 11,000 b/d of high-octane gasoline, and about 700 b/d of benzene, which can be expanded to 1,200 b/d to meet increases in demand. The plant is expected to make Argentina self-sufficient in benzene.



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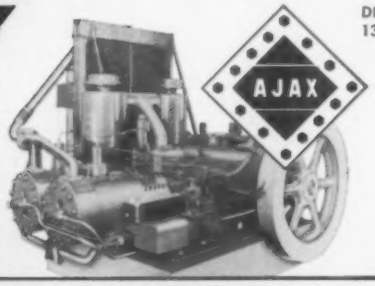

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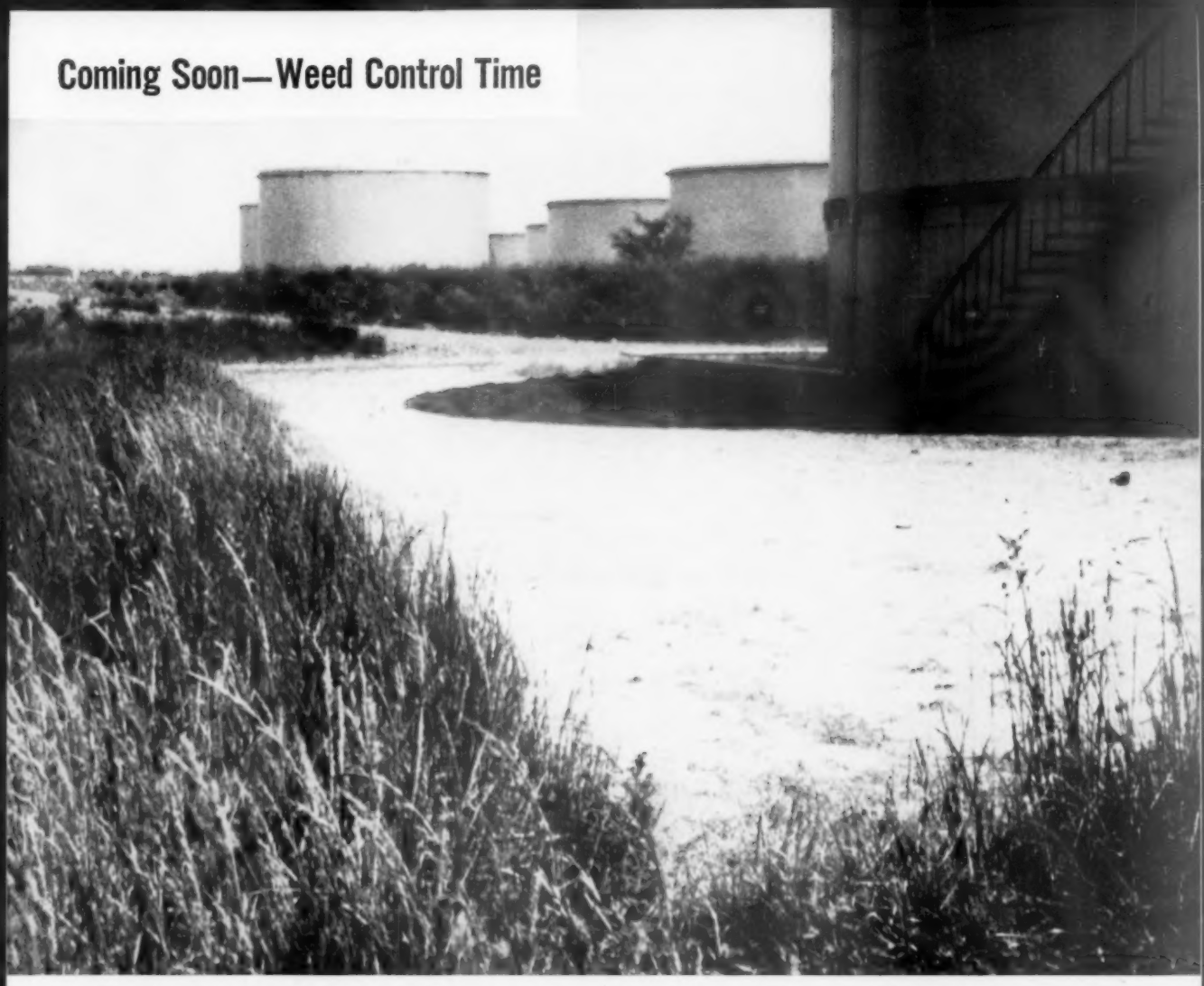
- Mid-Continent Supply Co. — Fort Worth, Texas

Coming Soon—Weed Control Time



The Tidewater Oil Company obtained excellent weed control around storage tanks at their Delaware Refinery by spraying Du Pont Karmex® and Du Pont Trysben® 200. The area was sprayed in the fall of '59—the photograph taken early fall of '60.

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Best way to control weeds is to prevent them from getting established. Spray key areas with Du Pont Telvar® monuron or "Karmex" diuron weed killer—just once—right at the start of the season. That way, weeds will be killed, as soon as they sprout, by these chemicals which stay in the soil for an extended period of time to kill through the roots. In addition, spraying early gives you an entire season of freedom from the fire hazards and maintenance difficulties caused by weeds around tanks, pipelines and well areas.

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PETROLEUM WEEK'S Fingertip Figures

This will likely be the best April on record for gasoline demand, say oil economists. Predictions are that total demand for motor fuel (including exports) will pass last year's record by 26,000 b/d, averaging 4,385,000 b/d for the month.

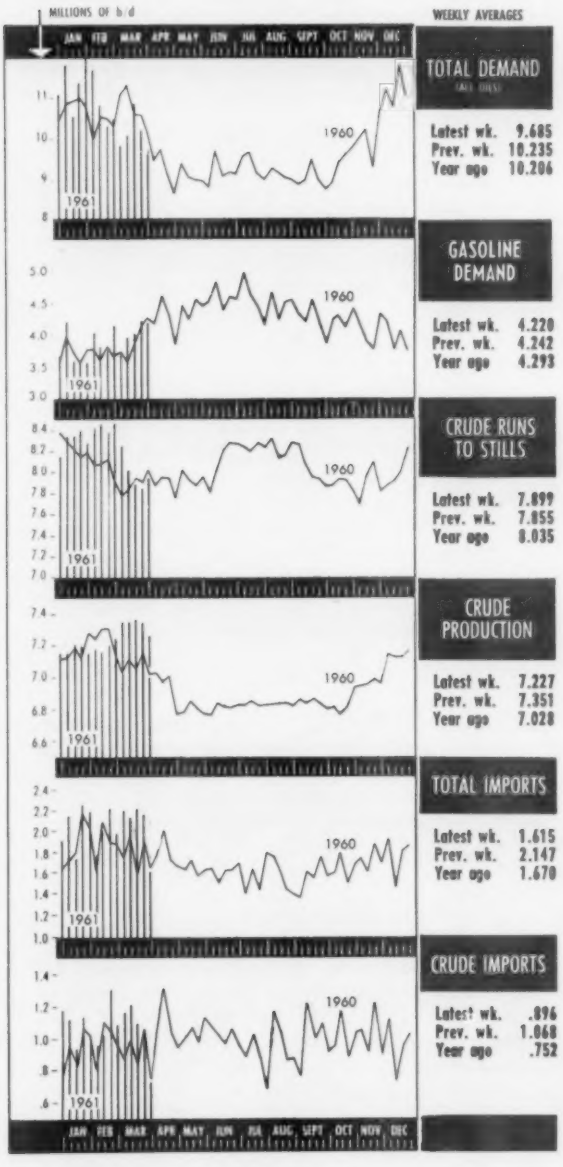
Gasoline demand had a good start: During the latest four weeks demand averaged 4,112,000 b/d, or 127,000 b/d higher than the like period in 1960.

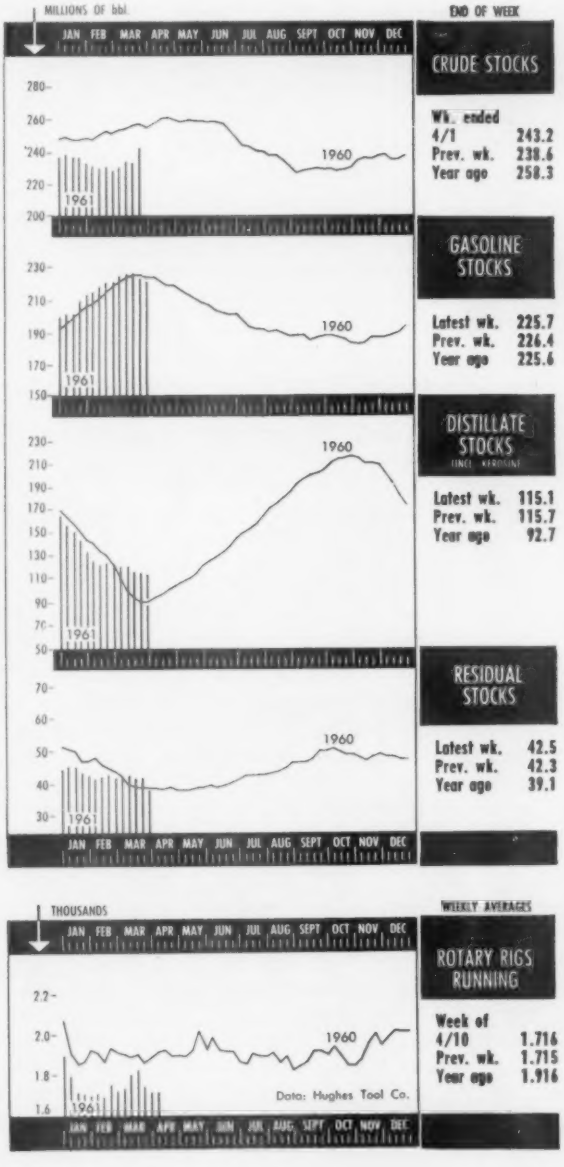
Gasoline stocks have turned the corner, and should continue on the downward trend if refinery runs are kept in check. Last week, motor fuel inventories fell 709,000 bbl. to 225.7-million bbl. They are still 664,000 bbl. higher than the year-ago level, however.

Distillates stocks took a contraseasonal dip of nearly 1.2-million bbl., to total 115.1-million bbl.

Refinery runs inched up 44,000 b/d last week from their lowest point since mid-December. Crude throughput averaged 7,899,000 b/d—136,000 b/d lower than a year earlier.

All figures below are for the week ended Apr. 7 unless otherwise noted.





Company Developments

Ralph M. Parsons Co. was awarded the contract to build the 7,500 b/d Isocracking unit for Standard Oil Co. (Ohio) at its Toledo refinery (PW—Oct.14'60,p42). It was the first Isocracking unit to be licensed by California Research Corp., which developed the process. Completion date for the $5-million unit has been set for November.

•

Eastman Oil Well Survey Co., Denver, moved into the tubular goods testing field last week. The company purchased Magna Scope Co., a testing and inspection firm a little more than a year old operating in the Permian Basin area.

Magna Scope last year purchased Pipe Check, Inc., to expand its services to include a full line of tubular testing methods. Eastman plans to "expand the latest methods of inspection and testing services into other major U. S. oil-producing areas."

•

Texas Gulf Sulphur Co. has taken its first major step toward diversification by entering the potash field. The company plans to spend $30-million on a new potash mining and processing plant, now getting under way near Moab, in southeastern Utah. The plant is designed initially to produce 1.1-million tons of muriate of potash annually, a capacity greater than the current output of any domestic producer, the company says. The plant is expected to start operating by the end of 1962.

•

American Meter Co., Philadelphia, will sell and service the complete line of positive displacement rotary meters made by Roots Connersville Blower Division, one of the Dresser Industries. The meters will be supplied to gas utilities and other companies in the U. S. and Canada.

•

Expansions

E. I. du Pont de Nemours & Co. has widened the test market area for its new plastic oilfield pipe to include East and West Texas, New Mexico, and Louisiana. Previously, the pipe, made from "Delrin" acetal resin, was test marketed in Kansas and the Tri-State Illinois Basin. Some 30 installations of the new pipe have been made since its recent introduction.

•

Pipe Line Service Corp. is expanding its facilities for making plastic pipe coatings. The American Steel Foundries subsidiary has opened a new 94,000-sq. ft. pipe coating and wrapping plant in North Lima, Ohio. It is the company's second facility to offer plastic coatings in addition to the traditional line of bituminous tar compound coatings. The first was the company's Sparrows Point (Md.) plant.

•

A Vinnell Corp. subsidiary has purchased Independent Iron Works, Inc., of Oakland, Calif. The plant, which fabricates structural steel, service station buildings, and similar products, will operate a division of Vinnell Steel Co.

•

Overseas

Otis Engineering Corp.'s new Mexican subsidiary is designed to keep step with the expanding needs of Pemex, Mexico's national oil monopoly. Otis Mexicana S. A. de C. V., to be located in Mexico City, will be a manufacturing center, as well as sales headquarters for the company's line of completion and production equipment. The company hopes that stations to provide Otis wire line service will be created in the near future.

•

Goodrich-Gulf Chemicals, Inc., has arranged a synthetic rubber knowhow exchange with Chemische Werke Huels, Marl, West Germany. It covers both cis-polyisoprene and cis-polybutadiene stereo specific rubbers.

•

Petroleum engineering students in Yugoslavia will get a training assist from Lane-Wells Co., Houston, one of the Dresser Industries. The company is shipping a series of education exhibits on well logging and completion operations to the mining faculty at Novi Sad, in cooperation with "Naftagas," the country's oil enterprise.

P. H. DUVAL has been elected vice-president and a director of Cities Service Production Co., Bartlesville, Okla. The company is the Cities Service Group's crude oil and natural gas subsidiary, and operates principally in Texas, Oklahoma, Louisiana, and the Gulf of Mexico. DuVal will also continue as manager of Cities Service Petroleum Co.'s natural gas division in Bartlesville. **Z. E. Stucky** will move from Bogota, Colombia, to Bartlesville to become manager of the Mid-Continent region in the exploration division of Cities Service Petroleum. He was formerly general manager of Colombia Cities Service Petroleum Co. At the same time, **M. J. Wells** will return to the headquarters office staff of Cities Service Petroleum as assistant chief geologist. Wells has been serving as assistant chief geologist and interim manager of the Mid-Continent region. **Harry McMullen** will be the new Mid-Continent region development manager.

A. B. Hersberger

P. H. DuVal

DR. ARTHUR B. HERSBERGER will succeed **Dwight T. Colley** as vice-president of marketing and a director of Atlantic Refining Co., Philadelphia. Colley retires May 1. Hersberger is now Atlantic's general manager for marketing. **Robert H. Colley,** a former president and chairman of Atlantic, will retire from its board on May 2. He joined Atlantic in 1919, and was elected president in 1937, a position he held until 1952, when he was elected chairman. He retired from that position in 1954, but continued as a director.

CHARLES H. BURKHARDT has been named vice-president of the newly created National Oil Fuel Institute, which resulted from the merger of the Oil Heat Institute of America and the National Fuel Oil Council. Burkhardt was formerly managing director of OHI. **Fred Burroughs**, formerly secretary of NFC, will be manager of the organization's promotion-communications division. **Ralph Hartell,** NFC communications director, will have a similar position in NOFI.

DR. ROY N. GILES succeeds **Thomas E. Stockdale** as manager of American Oil Co.'s Mandan (N.D.) refinery. Stockdale is retiring after 38 years with American Oil. Giles has been assistant manager of the North Dakota refinery since 1954. American Oil is the recently expanded national manufacturing and marketing affiliate of Standard Oil Co. (Ind.). Giles joined the Indiana Standard organization in 1930, and became research chemist at the Casper (Wyo.) refinery laboratory in 1934. Later he held several positions at the Whiting (Ind.) research laboratories, and in 1945 became head of all technical service activities there. In 1947 he became director of technical service for the parent company's midwest refineries, a position he held until 1954.

F. D. DENNSTEDT has been appointed assistant general manager of Humble Oil & Refining Co.'s manufacturing division. He had been assistant general manager of the company's Baton Rouge (La.) refinery. Five other posts in the division have also been filled: **P. E. Kuhl,** former assistant general manager of manufacturing for Esso Standard, was named administrative coordinator; **F. A. Youngs,** former assistant controller of Esso, division controller; **F. M. Doughty,** former manager of the technical division in Esso's manufacturing department, manufacturing coordinator; **C. H. Kollenberg,** previously manager of the coordination division at the Baytown refinery, assistant manufacturing coordinator in charge of planning; and **J. P. Cogan,** former assistant manager of the technical division in Esso's manufacturing department, assistant manufacturing coordinator in charge of economic studies. All will be headquartered in Houston.

T. J. Williams

F. D. Dennstedt

TOM J. WILLIAMS will manage Commonwealth Oil Refining Co.'s refinery at Ponce, Puerto Rico. He was formerly manager of operations for the combined refineries of Leonard Refineries, Inc.

R. D. REEDY has been named exploration manager of Gulf Oil Corp.'s Casper (Wyo.) area. Reedy, who joined Gulf in 1952, was named senior geologist at Sacramento, Calif., in 1958, his most recent position. Gulf's Casper area covers Wyoming, Montana, North and South Dakota, and the North Park area of Colorado.

FRED J. WELLINGTON has been appointed general manager of operations for Refineria Panama, S.A., with offices in Panama. He was formerly manager of manufacturing at International Petroleum Co.'s refinery at Barranca, Colombia. Refineria Panama, jointly owned by Continental Oil and interests of National Bulk Carriers, Inc., will operate a refinery in the Republic of Panama, scheduled for completion in 1962.

VALLIANT C. BAIRD is the new medical director of Humble Oil & Refining Co., in Houston. He had been chief physician of the former Humble division.

WILLIAM J. ZEMAN has been nominated for election as director of Phillips Petroleum Co., Bartlesville, Okla. He will succeed **Rayburn L. Foster,** vice-president and general counsel, who will retire on Apr. 25. Zeman is currently general attorney of the company.

W. J. Zeman

E. B. Blease

ERNEST B. BLEASE will head the newly created regulatory and forecasting division of Northern Natural Gas Co., Omaha, as vice-president. He was formerly director of rate and budget. His experience before joining Northern included 14 years with the Federal Power Commission.

PAUL M. PITTS will assist the general manager of Atlantic Refining Co.'s research and development department, Philadelphia. He was formerly research manager. **John C. Martin** has been appointed manager of the general services division of the research and development department. He was previously director of the administrative section of the division.

P. M. Pitts

S. O. Tostengard

STANFORD O. TOSTENGARD is the new superintendent of Gulf Refining Co.'s New Orleans district. He was formerly foreman of the company's Leeville (La.) area, and succeeds **J. A. Brown,** who has retired. Tostengard will supervise Gulf's pipeline operations in eastern Louisiana and southern Mississippi.

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JOHN W. COLLINS is the new president of Grove Valve & Regulator Co., Oakland, Calif. The Walworth Co. subsidiary is a manufacturer of valves and regulators for the petroleum and aerospace industries. Collins was formerly senior vice-president and chief executive officer of the company. He has been with Grove for 18 years.

J. W. Collins

E. E. Rubac

ELMER E. RUBAC has been named president of American Iron & Machine Works Co. The Oklahoma City manufacturer of oil well drilling equipment is a subsidiary of American Machine & Foundry Co. Rubac, former executive vice-president, succeeds **M. G. McCool**, who has resigned.

JOHN H. CLARKE moves up to vice-president of CompuDyne Corp.'s systems division, with headquarters at Hatboro, Pa. He was named manager of that division in 1959, after serving as project manager and regional sales manager. CompuDyne manufactures computer-operated automatic control systems for the aircraft, missile, and industrial process fields.

PAUL R. DES JARDINS has been appointed manager, engineering planning, for Worthington Corp., Harrison, N.J. He was formerly manager, production and marketing planning department. **Joseph E. Seibold** has been named manager, administration, of the company's resale sales department, a newly created post. He was formerly eastern region resale sales manager.

E. E. Carlson

T. J. Williams

ELDON E. CARLSON moves up as western product manager for Rockwell Manufacturing Co.'s petroleum and industrial meter division, in Pittsburgh. He will be responsible for petroleum and industrial meter sales west of the Mississippi River. He was formerly a sales engineer in the company's Houston office. **THOMAS J. WILLIAMS** has been appointed branch manager of the company's El Paso (Tex.) office, responsible for meter and valve sales in West Texas and southern New Mexico.

SAM W. PEARCE, CECIL B. GREER, GILBERT H. TAUSCH, and **ALBERT A. HUGHES** have been promoted to new positions at the Houston headquarters of Camco, Inc., manufacturer of gas lift equipment and wireline tools for production and well service. Pearce, who has been Camco's vice-president, sales, since 1953, becomes senior vice-president, and Greer, formerly director of North American sales, succeeds him. Tausch, formerly director of research and engineering, moves up to vice-president, research and engineering, and Hughes, formerly factory manager, has been appointed vice-president, production.

R. L. BOYER is now vice-president of advanced planning for Cooper-Bessemer Corp., Mt. Vernon, Ohio. He will devote his full time to advance product planning, and will be involved in studying products that can further contribute, by acquisition, to C-B's diversification program. Boyer was most recently C-B's vice-president and director of engineering. **Lt. Gen. Leslie R. Groves,** U.S. Army (ret.), has been elected a director of Cooper-Bessemer. He is presently a vice-president of the Remington Rand Division of Sperry Rand Co., responsible for the operations department and construction division.

LEWIS J. BICKING, JR., will manage sales for Merla Tool Corp., Dallas manufacturer of gas lift equipment. He succeeds **C. D. Fletcher,** who is retiring. Bicking was formerly assistant sales manager.

F. T. TAYLOR has been transferred from West Texas to manage a new branch office and warehouse for Baker Oil Tools, Inc., in McComb, Miss. This is the 70th operating location for the company in the U.S. Taylor had held the position of sales and service engineer in Odessa.

HARRY H. CHAPMAN has been appointed transportation sales manager for Owens-Corning Fiberglas Corp.'s sales to manufacturers division. He was formerly supervisor of the firm's electrical insulation apparatus sales. Chapman will be in charge of Fiberglas sales to the transportation industry, and the development of new applications of insulation, Fiberglas-reinforced plastics, and other products in the automotive, railroad, truck-trailer, aircraft, packaging, and pipeline fields.

J. DAVIDGE WARFIELD has been promoted to vice-president, sales, for Veeder-Root, Inc., Hartford, Conn. He has been manager of mar-

keting for the company since last year. **W. C. Stauble,** president of Veeder-Root, will also serve as chairman of the executive committee. At the same time, **Graham H. Anthony,** formerly chairman of the company's finance committee, was named chairman of its investment committee.

ROBERT H. STUART has been elected vice-president in charge of industrial relations for John Wood Co., a manufacturer of gasoline pumps and other service station equipment. He was formerly in charge of the company's labor relations.

WILLIAM H. PETERSON has been named manager, training and planning, Hyster Co., Portland, Ore. He was formerly assistant to the director of personnel in organization development. **CHARLES A. RICHMOND** has been appointed personnel manager, general office group. He moves from the company's engineering department.

E. A. Dunn R. Cavnar

E. A. (ED) DUNN has been appointed to the newly created position of regional manager, Gulf Coast region, Continental-Emsco Co., in Houston. This includes the south Texas and south Louisiana divisions of the company. **RICHARD CAVNAR,** former district manager at Houston, will succeed Dunn as manager of the south Louisiana division, in New Orleans, and **Vernon Frames** will succeed Cavnar as district manager in Houston. He has been a sales representative and division drilling equipment specialist in Houston.

W. H. NASS has been appointed manager, sales order department, for LFM Mfg. Co., Atchison, Kan., subsidiary of Rockwell Mfg. Co. Nass, who was formerly production manager, will be responsible for liaison between sales, engineering, and production. At the same time, **Clement A. Trapp,** who was formerly foundry superintendent, was appointed service engineer, and **John Moore** was named sales correspondent for the Kansas City area. Trapp will be in charge of customer casting problems, and Moore in charge of general sales service. All three men will report to **T. R. Eggert,** sales manager for the company.

WILLIAM M. BURRIS has been promoted to manager of district sales in Houston for the Shippers' Car Line division of ACF Industries, Inc., and **JAMES H. LYON** has moved up to manager of district sales for the division in Chicago. Burris, who joined Shippers' in 1953 as a sales representative in the Houston offices, succeeds **Albert H. Johnson,** who has retired. Lyon joined Shippers' in 1959 as a senior sales representative.

CHARLES K. AARON is the new president of Wayne Pump Canada, Ltd., Toronto. He was formerly assistant to **A. E. Trafford-Owen,** whom he succeeds. Trafford-Owen is retiring.

C. K. Aaron E. P. Tagge

EDWARD P. TAGGE has been promoted to assistant to the president of Beckman Instruments, Inc., Fullerton, Calif., with responsibility for coordinating the company's business acquisition program. He was formerly general auditor. **Robert A. Lineberger** has been appointed to the newly created position of assistant controller of the company. He was formerly controller for three Beckman divisions. Lineberger will be responsible for financial analysis programs on both a company-wide and divisional basis.

J. PENN RUTHERFOORD will join International Resistance Co., Philadelphia, as executive vice-president. He is now general manager of Raytheon Co.'s commercial apparatus and systems division.

A. L. Wallace A. G. Evans-Lombe

A. L. WALLACE is now executive vice-president and secretary-treasurer of Iverson Supply Co., Tulsa, and **A. G. EVANS-LOMBE** has been promoted to vice-president, sales. Wallace has been with the company for over nine years, and is located at the Tulsa home office. Evans-Lombe, who joined the company last year, is located at Ft. Worth. Other officers elected at the company's recent stockholder meeting include **S. J. Iverson, Sr.,** president; **P. D. Iverson, Sr.,** vice-president; **M. C. Niblack,** vice-president of sales; and **E. L. Lambert,** vice-president of store and field operations.

ARTHUR STERNBERG has been appointed vice-president and general manager of the electrical division of Fairbanks, Morse & Co., headquartered at Freeport, Ill. He succeeds **George H. Herrick,** who will head division headquarter sales of large electrical machinery at Beloit, Wis.

A. W. HAIL has been promoted to special representative, tubular products, for Jones & Laughlin Supply Division at Dallas. He was formerly salesman in J&L's Dallas city sales office. In his new position, he will serve customers in East Texas, North Texas, southern Oklahoma, and northern Louisiana.

STUART R. FERGUSON has joined the analytical and control division of Consolidated Electrodynamics Corp., Pasadena, Calif. He will report in a staff capacity to **Harold F. Wiley,** vice-president and general manager of the division. For the past five years, Ferguson has been production design staff engineer for the aircraft division of Hughes Tool Co.

LOUIS EARLY is the new sales-service representative at Odessa, Tex., for Oil Center Tool Co. He was formerly a warehouseman for O-C-T at Shreveport, La.

JIM MITCHEM is manager of Franklin Supply Co.'s new store at Poteau, Okla.

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PETROLEUM WEEK

Mutual Problems Need Mutual Solutions

PETROLEUM IMPORTS FROM CANADA pose a ticklish problem for the U.S. that will be difficult to solve at best. There is strong sentiment that the overland imports coming into the northern part of the nation should be curtailed.

There also has been some agitation for eliminating the exemption from strict allocations that overland imports enjoy, especially since the Canadian government decreed a policy earlier this year of encouraging greater exports to the U.S.

Producer groups on both sides of the border recently have shown signs of taking a sane approach toward a possible solution of the problem. Minor S. Jameson, Jr., executive vice-president of the Independent Petroleum Assn. of America, told a meeting of the Independent Petroleum Assn. of Canada that both have "common problems and the common objective of maintaining a healthy, expanding industry in the face of a world-wide oversupply of oil." He urged a "continental" oil policy.

LATE THIS MONTH the Canadian group will present its views at a meeting of IPAA's Ways & Means Committee at IPAA's midyear meeting in New Orleans.

U.S. producers have lost markets to Canadian oil in the Upper Midwest, in Michigan, and in Ohio. Canadian imports are not the entire cause for the economic troubles of the U.S. producers. But it is worth noting that while U.S. production of crude has declined 1.6% since 1956, Canadian output has increased 15.7%. Canadian producers still are not satisfied with the rate of growth. And, obviously, U.S. producers are not happy with their state of economic affairs either.

The reason the U.S. granted the exemption to overland imports was hemispheric defense. But it does not benefit hemispheric defense to adopt policies that penalize U.S. producers.

The policies that brought on the current situation—the U.S. exemption and the Canadian export plan—were government-decreed. In either country, such policies affect domestic producers the most.

SO IT IS HOPED THAT THE TALKS between the two producer groups can lead to a mutually acceptable plan that can be presented to the two governments for adoption. That would be a far more sensible method of arriving at a solution.

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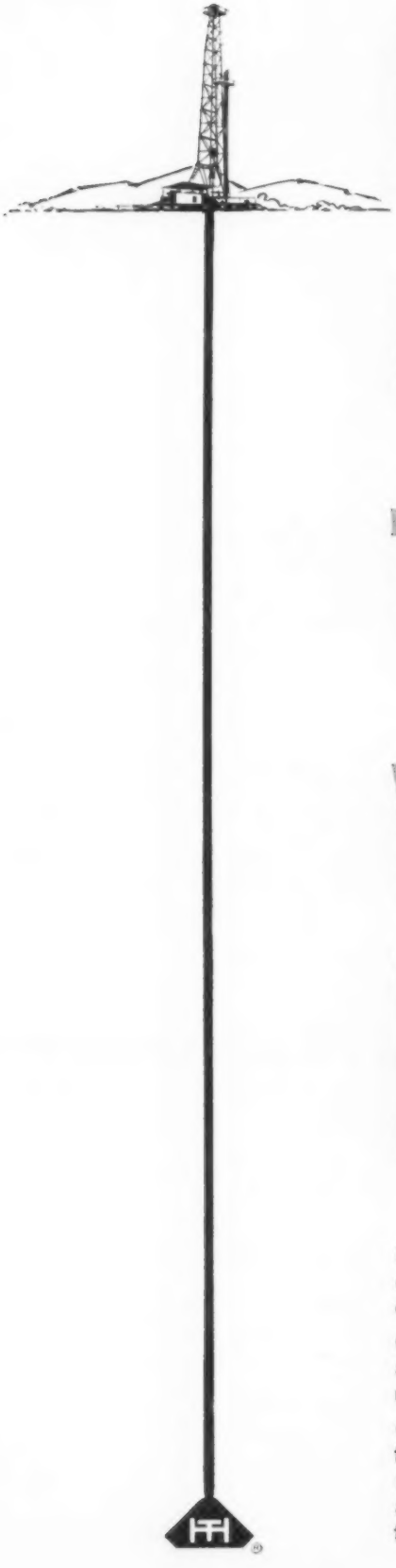

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